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ABSTRACT

This report presents the results of field testing of 26 environmental education units designed for use at the secondary level. Field testing was intended to determine the merit of the units. About 50 school districts, 170 teachers, and 900 students took part in the field test. The report includes a description of the units, design of the evaluation, results, and discussion. Appendices present data and statistics specific to various evaluative concerns. (Author/RE)

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AN EVALUATION OF
TWENTY-SIX SECONDARY ENVIRONMENTAL
EDUCATION UNITS

An Evaluation Report

prepared for the

EE OPTION 1 PROJECT TEAM

by

John Comstock
Evaluation Consultant
Division of Planning and Development
Minnesota State Department of Education

1975

SE 029 367

ABSTRACT

This report presents results of the field testing of twenty-six environmental education units. The units are designed for use at the secondary level.

Field testing was to provide information to aid in the determination of the merits of the units. Such determinations are, presumably, to be made by the project team.

The project team approach has been used in the Environmental Education Option I project. The team is composed of people from the Department of Natural Resources; The Minnesota Environmental Sciences Foundation, Incorporated; The Division of Instruction, State Department of Education; and the Evaluation Section, Division of Planning and Development, State Department of Education.

About fifty school districts, one hundred seventy teachers, and nine hundred students took part in the field test.

The students were asked to share their perceptions of unit worth and recommendations for unit change.

Each teacher was assigned a unit to test and given an option to test another. Students were randomly selected to take part.

Findings of the field testing suggest that:

*Individual and independent units are of limited value

*A more modular approach would be more realistic and useful for kids at this grade level (secondary) as compared with elementary units previously tested.

*Over ninety percent of all the teachers thought that:

Environmental education ought to be included in environmental education planning

Environmental education is important in the school curriculum

*With relatively few exceptions the twenty-six units were well constructed in the opinion of teachers who used them.

*With relatively few exceptions, the twenty-six units were implemented with few problems in the opinion of teachers who used them.

*The units were generally effective in attaining their (the unit's) goal(s).

*One problem mentioned quite often was that of time to do the activities. The problem was both in the activity asking too much and in the availability of teacher time.

The field testing findings suggest that it is reasonable to conclude that development of the units - at least most of them - is warranted. Modular approaches would be of more use. Teachers thought the units to be generally good. Further, they believe in environmental education.

EE OPTION I PROJECT TEAM

Richard Clark - Science Consultant, Department of Education

John Comstock - Evaluation Consultant, Planning and Development, Department of Education

Roger Grosslein - Environmental Education Consultant, Department of Natural Resources

Ed Hessler - Curriculum Specialist, Minnesota Environmental Sciences Foundation, Inc.

Gerald Jensen - Chief, Visitor Services, Department of Natural Resources

John Miller - Environmental Education Consultant, Department of Education

Donald Wagner - Curriculum Specialist, Minnesota Environmental Sciences Foundation, Inc.

TABLE OF CONTENTS

Page

ABSTRACT i

EE OPTION I TEAM ii

TABLE OF CONTENTS iii

LIST OF TABLES iv

BACKGROUND 1

The Twenty-Six Units 1

PURPOSE OF THE EVALUATION 2

Evaluation Questions 2

DESIGN OF THE EVALUATION 3

The Population and Sampling 3
Procedures 4
Instrumentation 5
Analyses 6

RESULTS 6

General Information 6
Teaching Experience 7
Environmental Education Experience 7
Opinions Relative to Environmental Education 8

The Units 10

Unit Profiles 11

DISCUSSION 13

APPENDIX A: 15

UNIT WRITING TEAM

APPENDIX B: 17

FIELD TEST SAMPLE PACKET

APPENDIX C: 18

SUMMARY OF TEACHER USE OF RESOURCE PEOPLE,
PLACES, AND ADDITIONAL MATERIALS IN THE UNIT
FIELD TESTING

APPENDIX D: 19

SUMMARY OF STUDENT RESPONSES TO FOUR SCALED ITEMS

APPENDIX E: 20

INDIVIDUAL UNIT FIELD TEST DATA

A Classroom Newspaper 1-0
It's Your Decision 2-9
Environmental Magazines 3-17
Growing Environmental Crisis 4-25
Pollution: Cause and Effect 5-33
Environmental Halo 6-41
Pollution and Waste 7-49
Energy Crisis 8-57
Energy and the Individual 9-67
Orienteering 10-76
What Is It? 11-84
New Things 12-92
Student Interest 13-100
Recreational Vehicles 14-108
Wilderness 15-116
Mystery Walk 16-124
How Do You Feel? 17-132
Phosphorus Leaks 18-144
Create a Mammal 19-153
Interstate Highway 20-164
Interdependency 21-176
Our Desire for a Better World 22-184
A Different Perspective 23-192
Mother of the Year 24-200
Cemetary 25-208
We Would Like To Do Something 26-216

APPENDIX F: 224

COMPARATIVE PROFILES OF TEACHER OPINIONS RELATIVE TO THE INDIVIDUAL UNIT PARTS

APPENDIX G: 225

COMPARATIVE PROFILES OF TEACHER OPINIONS RELATIVE TO INDIVIDUAL IMPLEMENTATION

APPENDIX H: 226

UNITS NOT MEETING ARBITRARY CRITERION OF FIFTY PERCENT OR MORE TEACHERS

LIST OF TABLES

TABLE		Page
1	SAMPLE SIZE AND RESPONSES FOR FIELD TESTING OF OPTION I EE UNITS	3
2	DISTRIBUTION OF EE UNITS IN TERMS OF THE NUMBER OF TRIALS EACH RECEIVED	5
3	NUMBER OF YEARS OF TEACHING EXPERIENCE OF TEACHERS FIELD TESTING THE ENVIRONMENTAL EDUCATION SECONDARY UNITS	7
4	NUMBER AND PERCENT OF TEACHERS FIELD TESTING UNITS WHO ARE CURRENTLY TEACHING ENVIRONMENTAL EDUCATION COURSES	8
5	NUMBER AND PERCENT OF TEACHERS FIELD TESTING UNITS WHO HAVE TAKEN COURSES IN ENVIRONMENTAL EDUCATION	8
6	PERCENTAGE DISTRIBUTION OF RESPONSES TO SCALED ITEMS DEALING WITH GENERAL FEELINGS TOWARD ENVIRONMENTAL EDUCATION	9

BACKGROUND

The EE OPTION ONE project began in 1973. A major purpose of the project has been to develop, implement, and evaluate environmental education curriculum materials designed for secondary teacher use.

The project has used the team approach. Project team members have represented the Department of Education, the Department of Natural Resources, and MESFI (Minnesota Environmental Sciences Foundation, Incorporated). A number of secondary education teachers were also involved.

A number of developmental processes have occurred since 1973. The result has been the production of twenty-six environmental education units for use by secondary teachers. All have been trial tested.

The Twenty-Six Units

Nine secondary education teachers were selected by the Team to write the Units. They each produced three units within their own disciplines. The teachers represented a variety of disciplines (Appendix A). Science, social science, home economics, physical education, and language arts were included.

General criteria used in writing were that the units:

be brief, simple, and easy to implement

be developed for specific subject areas, using topics which teachers can match to their programs

be a mix of indoor and outdoor experiences appropriate for urban/rural environments

should deal with natural resources in some experiences.

Writing took place during the summer of 1974. A two-day orientation preceded the writing. The purpose of the orientation was to discuss measurement, values clarification, sexism in education, and graphics. The goals were to provide writers with helpful guidelines.

Each of the twenty-six units has the same format. Each is composed of six parts:

Introduction
Goal Statement(s)
Activity Description
Data Sheet (where appropriate)
Evaluation (valuing)
Resources (where appropriate)

Final editing and preparation for trial testing was completed in late summer, 1974. By the beginning of the 1974-75 school year the Units were ready for use. (See Appendix B for sample Unit.)

PURPOSE OF THE EVALUATION

It was of interest to the team to obtain information relative to the "workability" of the Units. It was desirable, as part of the developmental process, to try the Units in actual teaching situations. It was decided to trial test the twenty-six Units. Results of the trial testing would be useful in Unit modifications. Final forms of the Units would be prepared for dissemination in the fall of 1975 as part of the State Environmental Education Program.

Evaluation Questions

Two questions were of interest. They were:

1. How do teachers feel, in general, about environmental education?
2. How did the Units work in the real teaching situation?

THE DESIGN OF EVALUATION

Evaluation of the Units involved trial testing as a means of obtaining data. The process involved trialing in a number of school districts in Minnesota. Information obtained from teachers related to Unit implementation. Opinions of students, relative to Units they experienced, were of interest also.

The Population and Sampling

All Minnesota secondary education teachers and students comprised the population with which the Units were concerned. All districts in Minnesota were invited to participate in the trialing.

Sixty districts elected to take part. This constituted the sample. Five teachers were selected within each of the districts. They were volunteers. The total number of teachers selected for field testing, then, was three hundred.

Every teacher was asked to test two Units. For every Unit, three students were randomly selected to respond to an evaluation form. Since there were 300 teachers each testing two Units, a total of 1,800 secondary students comprised the student sample (Table 1).

TABLE 1

SAMPLE SIZE AND RESPONSES FOR FIELD TESTING OF OPTION ONE EE UNITS

Strata	Number	Actual Responses	Percent Responding
Districts	60	50	83%
Teachers (5 per district)	300	175	58%
Students (3 per Unit taught)	1800	900	50%

Procedures

Packets were constructed to be sent to district coordinators who would distribute them. (See Appendix B for Trial Test Information.) The packets contained the following parts:

a. Cover letter to the district coordinator

b. Trial test information sheets for the coordinator and the teachers

c. EE Activity Units for each of the teachers

d. Feedback sheets, with cover letters, for the teachers and students

e. Return envelopes

A sample packet appears in Appendix B.

In general, the trial test procedures were as follows:

1. One Unit was assigned to each of the 300 teachers. In addition, each teacher was asked to select a second one from a list of three. This procedure was to insure that all Units would receive sufficient trialing.
2. A coordinator was selected in each district to facilitate the trial testing. In some cases, the coordinator was also a trial testing teacher. The coordinators' functions were:
   a. To receive the trial test materials.

   b. To collect and return all feedback sheets from teachers and students.
3. Teachers, at the completion of a Unit, were to randomly select three students to provide feedback. The teachers were also to provide feedback for each of the Units they field tested.

There was some variance between Units in terms of the number of teachers who trial tested them. Table 2 is the distribution of Units by times tested. It should be noted that not all Units actually tested were included in the analysis. Editing of the returned forms was done by the Team prior to analysis. Some unit feedback sheets were found to be unusable and were not included.

Table 2

DISTRIBUTION OF EE UNITS IN TERMS OF THE NUMBER OF TRIALS EACH RECEIVED

UNIT	TIMES TRIALED	UNIT	TIMES TRIALED
A Classroom Newspaper	9	Recreational Vehicles	12
It's Your Decision	8	Wilderness	7
Environmental Magazines	8	Mystery Walk	12
Growing Environmental Crisis	12	How Do You Feel?	27
Pollution: Cause & Effect	13	Phosphorus Leaks	13
Environmental Halo	5	Create a Mammal	28
Pollution & Waste	8	Interstate Highway	22
Energy Crisis	19	Interdependency	5
Energy & the Individual	13	Our Desire for a Better World	5
Orienteering	2	A Different Perspective	9
What Is It?	2	Mother of the Year	15
New Things	4	Cemetary	9
Student Interest	5	We Would Like To Do Something	4
		TOTAL	275

Instrumentation

Feedback from teachers and students was via feedback sheets designed by the evaluator and Project Team (Appendix B).

The teacher forms contained three parts: 1) a General Information part, 2) an Assigned Unit part, and 3) an Elected Unit part. The assigned and elected Unit parts had an identical format.

The General Information forms asked for information relative to teacher characteristics like subject area, background experience, and opinions regarding environmental education.

The Unit forms asked for information regarding the process and implementation of the Units. Both objective and subjective open-ended items were included.

The Student form was very brief. It simply asked the students whether they like the Unit, and what changes, if any, they would recommend.

Analyses

Descriptive statistics were computed on the data returned. Cross-tabulations were done where, in the opinion of the evaluator, it was appropriate. Subjective responses were listed.

All responses were coded in order to relate them to the Units.

RESULTS

Results are organized and presented as follows:

Summary of the General Information
Summary of Unit Data

General Information

One hundred seventy-five teachers responded. This is fifty-eight percent (Table 1) of the total sample of three hundred.

Teaching Experience

Most teachers who trial tested had ten or less years of experience (66%). Some, however, had taught as long as twenty-six years (Table 3).

TABLE 3

NUMBER OF YEARS OF TEACHING EXPERIENCE OF TEACHERS FIELD TESTING THE ENVIRONMENTAL EDUCATION SECONDARY UNITS

Years of Experience	Frequency	Percent
Less than 5	51	29%
5 - 10	65	37%
11 - 15	26	15%
16 - 20	11	6%
21 - 25	7	4%
26 and over	8	5%
No years	7	4%
	175	100%

Mean Years of Experience - 9.4 Years

Environmental Education Experience

About one-third of the responding teachers indicated they were currently teaching an environmental education unit (Table 4). Thirty-nine percent said they had taken environmental education courses before (Table 5) the trial testing.

TABLE 4

NUMBER AND PERCENT OF TEACHERS FIELD TESTING UNITS WHO ARE CURRENTLY TEACHING ENVIRONMENTAL EDUCATION COURSES

	Frequency	Percent
Teaching EE	53	30%
Not Teaching EE	116	66%
No Response	6	4%
	175	100%

TABLE 5

NUMBER AND PERCENT OF TEACHERS FIELD TESTING UNITS WHO HAVE TAKEN COURSES IN ENVIRONMENTAL EDUCATION

	Frequency	Percent
Have Taken	69	39%
Have Not	100	57%
No Response	6	4%
	175	100%

Opionions Relative to Environmental Education

Briefly, the one hundred seventy-five teachers responded in this manner (Table 6):

Over ninety percent were of the opinion that:

EE ought to be for all K-12 programs

Community members ought to be included in environmental education planning

An outcome of environmental education ought to be alternative ways to thinking about problems

EE involvement is not too much to ask of teachers

EE is important in the school curriculum

They would like to continue to be involved in EE

EE requires the use of resource people

Eighty-one percent said they thought EE required the use of outdoor sites.

There was more disagreement among the teachers relative to:

Whether they could define EE

Whether EE should encompass all subjects usually found in the school curriculum

TABLE 6

PERCENTAGE DISTRIBUTION OF RESPONSES TO SCALED ITEMS DEALING WITH GENERAL FEELINGS TOWARD ENVIRONMENTAL EDUCATION

Item	Scale Values				
	SA	A	D	SD	No Response
Environmental education should be included in all K-12 instructional programs.	52%	40%	5%	0%	3%
An outcome of environmental education ought to be alternative ways of thinking about problems.	40	57	1	0	2
Community members ought to be included in environmental education planning.	33	58	6	0	3
Involvement in environmental education is too much to ask of teachers.	1	2	57	37	3
I am sure I can define environmental education.	14	58	23	1	4
Environmental education should encompass all subjects usually found in the school curriculum.	19	53	23	2	3
Environmental education is important in the school curriculum.	41	53	2	1	3
I would like to continue to be involved in environmental education.	34	57	5	1	3
As a teacher I believe environmental education requires the use of resource people.	38	53	5	1	3
As a teacher I believe environmental education requires the use of outdoor sites.	38	43	14	1	4

The Units

Descriptive statistics are presented by each individual Unit in Appendix E.

The following format is used in presenting the summaries of the feedback information:

Use of resource people and resource places

Opinions of teachers relative to the implementation of the unit

Subjective responses of teachers relative to additional materials used, changes they would recommend, tips and hints for teaching, and further comments they have

Student feedback

Rather than present extensive results on all the Units here it is suggested that one refer to Appendix E. There, summary data for each individual Unit is provided.

It is somewhat inappropriate to compare Units. Each is quite different. A quick overview of the appendicized individual Units data, on the other hand, provides one with a good idea of how each Unit fared in the field.

Examination of the Unit profiles in Appendices F and G also serve as an initial check on overall teacher response to all Units. The profiles are helpful in identifying those Units which encountered more problems than others.

Unit Profiles

In looking at the Unit profiles in Appendices F and G an arbitrary criterion of fifty percent was selected for purposes of presenting field test results. This means, for example, that in the first profile in Appendix F, more than fifty percent of the 9 teachers field testing the Unit A Classroom Newspaper were of the opinion "the evaluation part was useful." Note that the mean scale score, in this case, is 2.3. If the criterion were exactly fifty percent, the scale mean would have been 2.5.

This strategy is used in the results presented here.

Appendix F presents profiles of teacher opinions relative to Unit parts. The parts include an evaluation section, data sheet, activity description, goal statements, and item introduction.

All twenty-six Units met the criterion (as defined above) for the evaluation data/worksheet parts. That is, for all Units more than fifty percent of the teachers thought the evaluation and data/worksheet parts of the Units were useful.

For the activity description, one unit did not meet the criteria. That Unit was Interdependency.

The Unit, A Different Perspective did not meet the criterion for the introduction part of the Unit.

Appendix G presents Unit profiles of teacher opinions relative to Unit implementation and effect.

Four of the twenty-six Units encountered more implementation problems than the others (using the fifty percent criterion). The Units were, It's Your Decision, What Is It?, A Different Perspective, and We Would Like To Do.

All but one of the teachers said they would be willing to, again, teach the Unit(s) they field tested. The one Unit was Interdependency.

The Units, Orienteering, New Things, Student Interest, Mystery Walk, Phosphorus Leaks, A Different Perspective, and Cemetary, did not meet the criteria of fifty percent for dependence on sites. This is, over fifty percent of those teachers testing these Units thought they required the use of sites.

Three of the Units did require use of resource people according to fifty percent or more of those testing them. The Units were, A Classroom Newspaper, Recreational Vehicles, and New Things.

In all but one Unit, Interdependency, over fifty percent of the teachers thought the Unit(s) goal statement was appropriate for the grade/ age level.

The Units helped students attain stated goals in all but two Units according to the criterion. These two were Interdependency and A Different Perspective.

Fifty percent or more of the teachers testing the following Units said the experience with the Unit(s) has caused them (or will cause) to modify other courses they teach. These Units were It's Your Decision, Pollution: Cause and Effect, Energy Crisis, Energy and the Individual, Orienteering, Our Desire for a Better World, and We Would Like To Do.

Cost and availability of materials were more of a problem for two Units than for the others. These Units were Mystery Walk and We Would Like To Do.

Students were generally enthusiastic about the Units. In three, however, fifty percent, or more, of the teachers said their students were not particularly enthused. The Units were It's Your Decision, Orienteering and Interdependency.

Four of the Units were not easy to relate to their own (the teacher's) subject area according to the criterion. These Units were Energy and the Individual, What Is It?, Interdependency, We Would Like To Do.

In all twenty-six Units over fifty percent of the teachers thought the Unit(s) they tested was a valid environmental education activity.

This concludes the presentation of the results of the field testing. A brief summary table of Units not meeting the arbitrary fifty percent criterion is presented in Appendix H.

DISCUSSION

The twenty-six Environmental Education Units were generally well received by teachers who field tested them. There were relatively few negative criticisms. There were substantial numbers of constructive criticisms.

Overall, on the basis of teacher opinion, the Units were all well constructed. Further, they did rather well in the classroom. Students said they liked them. It was something different for them.

In looking at the Unit profiles (Appendices F and G), it is evident that, in almost all cases, more than 50% of the teachers were favorable as measured by their responses on opinion items.

Students very often said Units were interesting and not boring. At least this suggests the Units are useful. Perhaps they can provide some motivational forces.

One problem was mentioned often. That problem was time. One gets the feeling that the small unit presented in a short time was too small and too short. Teachers and students implied that more depth and breadth would be desirable. This suggests, perhaps, a modular approach. More details are called for in several instances.

Most teachers had not taken courses in environmental education - about 39% had not. Less than that were currently teaching an environmental education course - about 30%. What this suggests is that the results are not necessarily biased by pre-existing interest in environmental education - at least on the basis of experience.

On the basis of these data it would seem reasonable to conclude that development of the Units is warranted. Teachers believe in environmental education and think the Units are good (although in need of revisions, changes, and so on). Students were, more often than not, supportive. They also provided suggestions for change, revision, and use.

If further use is to occur, each Unit's data needs to be reviewed. Recommendations and tips and hints given by teachers and students would be useful.

Those who must take the responsibility for revising these Units, producing teacher's guides, and so forth, should find the information obtained in the field testing helpful.

It goes without saying that judgments regarding the use of these Units requires more than what is provided in these data. Information herein should be used in concert with other sources of information. One's own experience and intuition are important, for example.

Generally, then, these twenty-six Units are workable, appropriate, and applicable in the classroom. It is desirable, however, that more depth and breadth be built into them. They would then, in the opinion of those who have experienced them, be of even more utility in the classroom.

APPENDIX A

UNIT WRITING TEAM

EE OPTION 1: SECONDARY EE UNIT TITLES

Author/Subject Area/ Junior High, Senior High	Titles	Special Considerations
Chris Elger Home Economics JrH/SrH	1) Pollution and waste in the home environment.	
	2) The energy crisis--How can you help?	Art work *
	3) Energy and the individual--How do you feel?	Art work *
Mimi Bergen Language Arts JrH	4) Pollution-An Examination of Cause and Effect.	
	5) Environmental Halo Effect in Advertizing.	
	6) Grow Environmental Crisis-A Role Playing Activity.	
Jerry Hoffstrom Life Sciences SrH	7) Phosphorus Leaks	
	8) An Interstate Highway Decision	
Kay Ingleman Social Studies	9) Our desire for a better world--Will we make it?	
	10) A different perspective in comparing environments.	
	11) Interdependency	Art work *
Ken Jeddeloh Life Sciences SrH	12) Mystery Walk	
	13) Create a Mammal	Art work *
	14) How Do You Feel About...	
Larry Meadors Physical Education JrH	15) New Things	
	16) Student Interest Survey	
	17) What Is It?	
Jim Norine Physical Education SrH	18) Recreational Vehicles-Are You For or Against?	
	19) Wilderness Sensitivity.	
	20) Orienteering-With a Difference	
Peggy Peterson Language Arts SrH	21) A Classroom Newspaper on Environmental Issues.	
	22) Environmental Magazines: Their Ethical Point of View	
	23) It's Your Decision.	*
Dennis Shonka	24) Mother of the Year Contest.	
	25) The Cemetary As A Source of Population Data.	
	26) We Would Like to Do Something About the Environment, But...	*

* Not yet in the hands of one John Miller.

APPENDIX B

FIELD TEST SAMPLE PACKET

State of Minnesota

Department of Education
Capitol Square, 550 Cedar Street
St. Paul, Minnesota 55101

October 2, 1974

Dear Mr.

Thank you for your support of environmental education. Your willingness to assist the EE OPTION I PROJECT in coordinating trial testing new secondary curriculum materials in your district is, indeed, appreciated.

Background Information

A major purpose of the project is to produce a useful collection of secondary EE activity units. This past summer, nine secondary teachers were selected to write twenty-seven prototype activity units. All of the teachers were experienced in environmental education.

The units are brief, easy-to-implement activities for social studies, life sciences, language arts, physical education, and home economics.

They are being trial tested in some fifty school districts throughout the State this fall. They will be revised on the basis of the trial testing. Feedback information will be disseminated in the fall of 1975 as part of the State EE program.

Although this developmental process is long-term, we believe it necessary in order to produce a useful collection of high quality EE units.

Trial testing these prototype manuscripts is a crucial part of the development process. As a trial-test district, you, your colleagues and students will be providing feedback necessary for revising manuscripts. Without your help and feedback, we do not have a direct link to the classroom and, consequently, no defensible means for revision. It is important to realize that our purpose is to evaluate the effectiveness of the units, not teachers or differences in instructional style. The information on the teacher and student feedback sheets will be used solely for the purpose of improving the manuscripts.

Each teacher involved will be assigned one manuscript and encouraged to select one other for trialing. The manuscripts should be complete, not requiring extensive preparation or equipment. Each participant should teach them as they are, without changing them in any way.

AN EQUAL OPPORTUNITY EMPLOYER

It is essential to follow the time line proposed for trial testing. This means that all participants should plan their schedules so that all trial testing is completed, feedback sheets are returned to you, and mailed to us by December 16.

This will require getting started early with all participants assuming part of the responsibility for meeting the time line. Specific tasks are described in detail on the Trial Test Information Sheet attached.

If you have questions, please contact the field person nearest your district. This person will also be checking with you to make sure the materials package is complete.

A follow-up session involving coordinators from trial-test districts may be desirable. You will be contacted well in advance of such a session. Regardless, we will definitely send you the results of the trial testing and plans for the dissemination of the revised materials.

Thanks again. We need your help!

Sincerely,

Don Wagner

Donald Wagner, Coordinator
EE OPTION I PROJECT

PROJECT TEAM:

Richard Clark - Science Consultant, Department of Education

Roger Grosslein - Environmental Education Consultant,
Department of Natural Resources

Gerald Jensen - Chief, Visitor Services, Department of
Natural Resources

John Miller - Environmental Education Consultant, Department
of Education

John Comstock - Evaluation Consultant, Department of Education
Division of Planning and Development

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TRIAL TEST INFORMATION SHEET

I. Trial Test Materials

1. Cover letter to district coordinator
2. Trial test information sheets (this one) - five (one for coordinator and each teacher)
3. EE Activity Units - three for each teacher participant
4. Feedback sheets with cover letters
    a. Teacher forms - five (one for each teacher)
    b. Student forms - thirty (one for each of three selected students in each of two units for each of five teachers)
5. One large envelope, manila, self-addressed for coordinator to mail teacher and student feedback sheets.

II. Trial Test Process

	Time Schedule	Tasks
A.	October 1: Receive trial test materials	**Coordinator:** Plan and conduct a meeting to: 1) distribute materials and, 2) discuss trial plans and time schedule. **Participants:** 1) select a second manuscript to trial test in addition to the assigned one, and 2) submit an approximate time schedule for trial testing
B.	October 1 - December 16: The trial test period	**Coordinator:** Check on trial test schedules for each participant. **Participants:** Assume responsibility for: 1) meeting schedules and 2) completion, and submitting feedback sheets to coordinator. a) both their own and their students.
C.	December 16: Deadline for mailing feedback sheets	**Coordinator:** Collect all feedback sheets, and 1) mail them in enclosed envelope to: a) John Miller, Consultant Environmental Education MN State Department of Ed. 644 Capitol Square Building 550 Cedar Street St. Paul, MN 55101

State of Minnesota

Department of Education
Capitol Square, 550 Cedar Street
St. Paul, Minnesota 55101

September 30, 1974

Dear Participant:

Part of Minnesota's EE OPTION I PROJECT involves development of Secondary EE Units. You have been asked to trial test some of them.

At the conclusion of your Unit trial testing, we would like you to share some of your experiences. The reason for our request is that we want to make every effort to learn more about and to improve upon these Secondary EE Units.

We will be interested in your feelings about EE, in general, as well as the specific Units you will be teaching. Important, too, will be your observations relative to Unit successes and failures.

So, as soon as you have finished the trial testing of your assigned and elected Units, complete the enclosed questionnaire. It shouldn't take long.

Please try to respond to every item. Then, just place it in the envelope, seal it, and return it to your coordinator. He or she will return it to us.

In addition to your help, we would like to have three students from each Unit share some of their thoughts with us. Enclosed in this packet you will find six student questionnaires for that purpose.

We would like to have you distribute them to randomly selected students: three from the assigned Unit group and three from the elected Unit group (if applicable). The method to be used in selecting them is explained on the attached sheet. It is important that they complete the questionnaire as soon after they have completed the Unit as possible.

Envelopes are enclosed with each Student Survey. Have them place the completed form in an envelope, seal it, and return it to you. Please return the envelopes to your coordinator. He or she will mail them to me.

If you are concerned with confidentiality, you needn't be. Neither you, your district, nor your school will be identified in any way in any reports.

Please try to complete this as soon as you can while the Units are fresh in your mind. We will appreciate your views very much. If you do have questions, please contact your coordinator.

Thank you for your time and effort.

Sincerely,

John Miller, Consultant
Environmental Education
Minnesota Department of Education

JM/jmn

Enclosures

METHOD OF SELECTING THREE STUDENTS FROM EACH SECONDARY EE UNIT

1. Begin with the class list.
2. Count the number in the class.
3. Divide the number in the class by 3.
4. If this number is odd, round up to next highest number.
5. Count off, using the number from #3 (or #4 if applicable) and circle. Then count off another group to select the second student. Do likewise for the third.
6. If you come to the end of the list, simply continue your count at the beginning of the list.

EXAMPLE: Step 2 - Number in the class = 11

Step 3 - 11/3 = 3 2/3

Step 4 - Round up to 4

Step 5 - $\overset{3}{\textcircled{A}}$ B C $\overset{1}{\textcircled{D}}$ E F G $\overset{2}{\textcircled{H}}$ I J K

Students D, H, and A were selected - in that order.

SAMPLE UNIT

TRIAL EDITION
ENVIRONMENTAL
EDUCATION

EE: OPTION ONE PROJECT

(1973-75)

Secondary environmental education curriculum materials
developed by the
Department of Education, Department of Natural Resources,
and The Minnesota Environmental Sciences Foundation, Inc.

MINNESOTA ENVIRONMENTAL EDUCATION PROGRAM

ENVIRONMENTAL MAGAZINES; THEIR ETHICAL POINT OF VIEW

Introduction

Every year more and more people choose magazines as a means of obtaining information. As a result, every year new magazines are printed in an attempt to meet the diverse needs and interests of the reading public.

Although our schools try to prepare students to read widely and critically, they seldom encourage students to apply those skills to magazines, even by implication.

In these materials students will be helped to apply their reasoning skills to magazines, and to increase their awareness of magazines which focus on environmental issues. In addition, the students will have the opportunity to compare and contrast different magazines dealing with the environment, and they will be exposed to the vast differences in the environmental philosophies, or environmental ethics, reflected in these magazines. If they come to understand the ethical positions presented in these magazines, they will have additional help in forming an ethical position of their own toward environmental issues such as the energy crisis, taconite disposal, what action to take toward endangered species, etc. At the same time, these magazines can provide students with enjoyable leisure-time reading.

Goal Statements

Some purposes of this activity are to help students to:

- compare and contrast environmental magazines for format and contents,
- determine the ethical position toward the environment in each magaizne,
- compare and contrast the environmental ethics of various magazines,
- evaluate the effectiveness of the magazines examined,
- think about their own environmental ethical position.

Activity Description

1. Getting started. You will need to gather a supply of magazines. A list of magazines is included in these materials. The list is divided between recommended magazines and suggested magazines. The list is not all-inclusive; students could have

others in their homes that would be useful. With a little time and student help, enough magazines can be found to begin.

Spend some time in class browsing through the magazines and sharing stories, facts, etc. from them.

Have students put up a copy of each magazine on the bulletin board so that the class will become familiar with titles and covers.

Divide the class into small groups of 3-5, and ask them to analyze a magazine. A RETRIEVAL LIST is included to provide a standard form for all the groups' analyses. You may duplicate the RETRIEVAL LIST so that each group has a copy. While this list may at first seem cumbersome, keep in mind that it serves a double purpose. It requires the students to read the magazine carefully and to evaluate the information being read.

Reassemble the class and share the analysis results. Have each small group report to the class on the results of their analysis. Students may take turns reading aloud from their papers. Discuss similarities and differences in the contents and formats of the magazines. Can they be grouped in any ways? Have each group rank order the magazines from the one they liked the most to the one they liked the least. Ask them to explain the reasons for their ranking.

2. Deciding on the environmental ethic of each magazine.

Duplicate the enclosed statement on ENVIRONMENTAL ETHIC, and give each student a copy. Read through the statement together so that any problems with definitions or meanings can be surfaced and settled.

Divide the class into small groups of 3-5 again, and give them several issues of the same magazine(s) they analyzed initially. Give them time to read through the magazines, keeping the ENVIRONMENTAL ETHIC statement in mind.

Ask each group to identify and describe what they decide is the environmental ethic of their magazine.

Reassemble, and write the following categories on the board: Conservation/Preservation, Resource Management, Recreation, Business/Profit.

Have each group read aloud the characteristics of their magazine's environmental ethic. Have each group then place their magazine in one of the categories and explain the basis for their choice. Have the class add and define additional categories if necessary.

Environmental Magazines; Their Ethical Point of View

3. Individual environmental ethic.

Have each student write a short paper on one of the following topics:

1) Define your own environmental ethic.
2) Compare and contrast your ideas with one of the environmental ethics of a category on the board.

Evaluation

1. Ask each student to choose one activity from the list below, or design an activity of their own, to show what they learned from the magazine analysis. If a student has an original idea, ask him/her to discuss it with you first.

1) Make a poster advertising your favorite environmental magazine; be sure to make clear the strong points of the magazine.
2) With several other people, create a small magazine which reflects your school environment.
3) Create a small magazine which reflects your home environment.
4) Read articles from different magazines on the same controversial issue. Write an essay comparing and and contrasting the points of view presented.
5) Investigate a topic which aroused your interest. Complete a project showing what you learned.
6) Write a true story about one of your own experiences in the out-of-doors.
7) Make a photographic essay of your home, neighborhood, town, or school environment. Assume an unusual point of view.
8) Write an essay on a controversial issue and send it in to one of the magazines.
9) Write a letter to your congressman expressing your concern about an environmental issue which you learned about in one of the magazines. Give a constructive solution to the problem. Be sure to refer to the magazine and article title and author.

2. To determine whether or not students grasped the ethics idea, try this: Briefly explain an environmental issue (real/imaginary) and the conflicting interests involved. Ask students to describe what action would be taken by a proponent of each of the four ethical positions: Conservation/Preservation, Resource Management, Recreation, and Business/Profit.

3. To decide what the activity accomplished for each student on a personal level, have each student complete the following questions:

   1) Did you enjoy reading the magazines?
      a lot   it was OK   a little   not at all

   2) List in order of your preference, the three magazines you liked the most. Explain why you liked each magazine.

   3) Which magazine communicates an environmental ethic similar to your own?

   4) Do you think your environmental ethic has changed after reading these magazines?
      a lot   a little   not at all

   5) Do you think you are more informed on environmental issues and concerns after reading these magazines?
      a lot   a little   not at all

   6) Which magazine do you think you will buy or subscribe to in the future?

Environmental Magazines; Their Ethical Point of View

ENVIRONMENTAL ETHIC

This term refers to the point of view or basic philosophical position which an individual or a group of individuals hold toward theenvironment. It includes ideas on a person's relationship and responsibilities to the forms, both living and non-living, which make up the environment. These beliefs may be based on emotions or experiences; they may be well thought out, logical positions based on information and research.

Some common philosophical positions toward the natural environment that can be identified among people are: Conservation/ Preservation--or a belief that the natural environment should be saved from exploitation, and that its riches are ends in themselves; Resource Management--or a belief that the natural environment should be manipulated by humans for its improvement or control; Recreation--or a belief that the natural environment should be exploited or developed for the amusement and fun of people; Business/Profit--or the belief that the natural environment should be exploited or developed to increase wealth. When people or groups subscribe to a given ethic, their actions usually are in accord; issues are understood, and problems are solved according to point of view.

In order to identify a person's or a group's environmental ethic, it is necessary to gather information directly or to infer opinions indirectly from what is spoken or written. Below are a few questions which should help you to identify the characteristics which make up an environmental ethic. If you carefully read a magazine and keep these questions in mind, you should be able to imagine how the editors of the magazine might answer the questions. If you think about these questions and try to decide how you would answer them, it may help you to clarify your own, personal environmental ethic.

1. What is an individual's responsibility to the wildlife in the environment?
2. How should wildlife be cared for or dealt with?
3. What should be done about endangered species?
4. What restrictions should be put on hunting and fishing?
5. Should pollution be stopped in order to protect wildlife?
6. Should pollution be stopped? Restricted? Ignored?
7. Who is responsible for paying for law enforcement of anti-pollution laws?

Environmental Magazines; Their Ethical Point of View

8. Are our natural resources finite or infinite?
9. To what extent should we conserve natural resources?
10. Who should control the use of natural resources?
11. Which natural resources are most valuable? Why?
12. To what extent should natural resources be developed at the expense of the environment?
13. Should wildlife and geographical areas be preserved just for their own sake?
14. Should camping be regulated? To what extent? Why?
15. Is there wilderness left in our country?
16. What is wilderness?
17. What part should science and technology play in the shaping of our environment?
18. Should we return back "to nature" and more primitive living?

Environmental Magazines; Their Ethical Point of View

RETRIEVAL LIST: A Tool for analyzing the format and content of a magazine

The Cover

1. Does the cover "grab" your attention? Why or why not?
2. Does the cover have a message? If so, what is it?
3. Does the cover feature people, wildlife, scenic landscapes, or a close-up of some aspect of nature?
4. Is the cover a photograph or an artist's drawing?
5. Is the cover related to an article in the magazine?

Table of Contents

1. What organization publishes the magazine?
2. In what city is it published?
3. How long has the magazine been published?
4. What is the cost of a one-year subscription?
5. How frequently is the magazine published?
6. List the regular features.

Editorial Page

1. What issue or concern is commented on by the editor?
2. What position is taken?
3. Is any action suggested? If so, what?

Letters from Readers

1. Are differeing points of view on the same subject presented?
2. How many positive letters are included?
3. How many negative letters are included?
4. Are the letters comments, or do they include suggested actions?

Illustrations

1. Does each article have a picture to attract the reader's attention?
2. Are artists' sketches used with some articles?
3. Do the illustrations increase the effectiveness of the articles?
4. Are the pictures vivid, clear and well photographed?
5. Are the pictures well composed?
6. Are the graphs and charts well done?
7. Are the graphs and charts easy to understand?
8. Do they increase the effectiveness of the articles?

Advertisements

1. What kinds of products are advertised?
2. Do these advertising claims appear to be consistent with the ideas presented in the magazine?
3. Are there too many advertisements in the magazine?
4. Are the advertisements spaced throughout the magazine?
5. Do the advertisements disrupt your reading?
6. Are the advertisements more interesting than the articles?

Environmental Magazines; Their Ethical Point of View

Contents

1. Are there any short stories?
2. Are they true or fictional?
3. Are they interesting? Why or why not?
4. Are any individuals the focus of a feature story? If so, why?
5. What animals are featured in articles?
6. What geographical areas are featured?
7. What natural phenomena are featured?
8. What plants, flowers, trees, etc. are featured?
9. Are there any articles which give instructions? If so, on what?
10. Are there any tests, quizzes, puzzles, games?
11. Are there any cartoons or jokes?
12. Are there any book reviews? Give titles and authors of books reviewed.
13. What controversial issues or concerns are presented?
14. What position is taken on each issue?
15. Are any environmental programs described or evaluated?
16. What pollution problems are presented?
17. What historical background articles were given? On what topics?

Environmental Magazines; Their Ethical Point of View

LIST OF MAGAZINES

I. Recommended Magazines

A. Preservation

1. National Geographic
2. Audubon

B. Conservation

1. National Wildlife
2. The Conservationist

C. Resource Management

1. The Minnesota Volunteer
2. Environment

D. (Recreation)

1. Backpacker

II. Suggested Magazines

A. Available in the library - public/school

1. Earth Journal
2. Ecology: The City
3. Ecology Today
4. Environmental Quality
5. The Futurist
6. Nature and Science
7. Wildlife Review

B. Available at your local grocery store/news stand

1. Field and Stream
2. Outdoor Life
3. Popular Science
4. Sports Afield

C. Magazines for the technically oriented

1. Environmental Science and Technology
2. Nature: International Journal of Science
3. Scientific American

Minnesota State Department of Education
St. Paul, Minnesota 55101

F-24-53 (9-74)

TRIAL TEST SURVEY

SECONDARY EE UNITS
EE OPTION I PROJECT

INTRODUCTION

This survey is to call upon you to share your Secondary EE Unit experiences with us. It would, indeed, be difficult to modify and improve upon the Units you have just trial tested without your help.

Try to respond to all of the items. Be candid. Remember we are interested in learning all we can about how the Units work in real teaching situations.

This questionnaire is composed of two parts. Part One: General Information, is intended to learn something about you, the teacher. Included are items dealing with your experience and how you feel, in general, about the area of environmental education.

Part Two: Secondary EE Unit, deals specifically with the Secondary EE Unit(s) you have trial tested. It is important for you to notice that there is an identical set of items for each Unit you have just taught. Each set is of a different color. Please respond to a set for each Unit you have tested for us.

Results will be held in confidence. Individuals, schools, and districts will not be identified. Thanks again for your time and effort.

PART ONE: GENERAL INFORMATION

How many years have you taught? ______

What subjects and at what level(s) do you teach?

Subject	Level

Are you teaching an environmental education course(s)? (i.e., Environmental Biology, Environmental Action, Natural History) Yes_____ No_____

If yes, what is the title(s), grade level(s), and length(s)?

Title(s)____

Grade Level(s)__________________________________

Length(s)_______________________________________

Have you taken courses in environmental education before? Yes_____ No_____

If yes, please briefly describe them.

Course(s) Taken	*Where	When	Credits Earned

*Include colleges, in-service workshops, etc.

Opinion

The following items are designed to provide you with an opportunity to express your feelings about environmental education, in general. Try to be as objective as you can. Respond to every item as you would most typically.

Strongly Agree	Agree	Disagree	Strongly Disagree	(please circle one response)
SA	A	D	SD	Environmental education should be included in all K-12 instructional programs.
SA	A	D	SD	An outcome of environmental education ought to be alternative ways of thinking about problems.
SA	A	D	SD	Community members ought to be included in environmental education planning.
SA	A	D	SD	Involvement in environmental education is too much to ask of teachers.

Strongly Agree	Agree	Disagree	Strongly Disagree	(please circle one response)
SA	A	D	SD	I am sure I can define environmental education.
SA	A	D	SD	Environmental education should encompass all subjects usually found in the school curriculum.
SA	A	D	SD	Environmental education is important in the school curriculum.
SA	A	D	SD	I would like to continue to be involved in environmental education.
SA	A	D	SD	As a teacher I believe environmental education requires the use of resource people.
SA	A	D	SD	As a teacher I believe environmental education requires the use of outdoor sites.

-End of Part I-

PART TWO: SECONDARY EE UNIT

THE ASSIGNED UNIT

What is the title of the Secondary EE Unit assigned to you?

____

In what subject area(s) did you teach the Unit? ______________________

____

What grade level(s) was this Unit taught in? ______________________

In the teaching of this Unit, did you utilize instructional materials in addition to those of the Unit? Yes_____ No_____

If yes, please briefly describe them.

Which of the following resource people did you use with your Secondary EE Unit? (check one or more)

Education people _____
Community people _____
Natural resource people _____
Other _____
I didn't use any _____

Which of the following resource places did you use with your Secondary EE Unit? (check one or more)

School site _____
Community _____
Regional _____
Other _____

Opinions

The following items are designed to provide you with an opportunity to express your feelings about your assigned Secondary EE Unit, specifically. Try to be as objective as you can. Respond to every item as you would most typically.

Strongly Agree	Agree	Disagree	Strongly Disagree	(please circle one response)
SA	A	D	SD	I had problems implementing this Unit.
SA	A	D	SD	I would teach this Unit again.
SA	A	D	SD	I think this Unit depends on the use of sites.
SA	A	D	SD	I think this Unit depends on the use of resource people.
SA	A	D	SD	Goal statements were appropriate for the grade/age level.
SA	A	D	SD	Activities in the Unit were effective in helping students attain stated goals.
SA	A	D	SD	Experience with this Unit has caused me to (or will) modify other courses I teach.
SA	A	D	SD	Cost and availability of materials necessary to teach this Unit have been a problem.
SA	A	D	SD	Most of my students were enthusiastic about the Unit.
SA	A	D	SD	The Unit was easy to relate to the subject area I taught it in.
SA	A	D	SD	The Unit is a valid environmental education activity.

The next five statements refer to the parts of the Unit.

SA	A	D	SD	The Introduction was adequate.
SA	A	D	SD	The Goal statements were clear.
SA	A	D	SD	The Activity Description was adequate.
SA	A	D	SD	The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)
SA	A	D	SD	The Evaluation part was useful.

Open-Ended Items

This part is to ask you for advice and suggestions specific to this Unit. Please provide as much detail as you can. Your comments in this section are especially important to us.

What changes would you recommend in this Unit before it is taught again?

What tips and hints do you have for others who may be teaching the Unit? (i.e., equipment, teaching strategy, resource people, etc.)

List materials you have used in addition to those recommended by the Unit.

Please feel free to make any further comments about this Unit, environmental education, in general, or any other related topics. Thanks for your time and effort.

PART TWO: SECONDARY EE UNIT

THE ELECTED UNIT

What is the title of the Secondary EE Unit elected by you?

____

In what subject area(s) did you teach the Unit? ______________________

____

What grade level(s) was this Unit taught in? ______________________

In the teaching of this Unit, did you utilize instructional materials in addition to those of the Unit? Yes_____ No_____

If yes, please briefly describe them.

Which of the following resource people did you use with your Secondary EE Unit? (check one or more)

Education people _____
Community people _____
Natural resource people _____
Other _____
I didn't use any _____

Which of the following resource places did you use with your Secondary EE Unit? (check one or more)

School site _____
Community _____
Regional _____
Other _____

Opinions

The following items are designed to provide you with an opportunity to express your feelings about your elected Secondary EE Unit, specifically. Try to be as objective as you can. Respond to every item as you would most typically.

Strongly Agree	Agree	Disagree	Strongly Disagree	(please circle one response)
SA	A	D	SD	I had problems implementing this Unit.
SA	A	D	SD	I would teach this Unit again.
SA	A	D	SD	I think this Unit depends on the use of sites.
SA	A	D	SD	I think this Unit depends on the use of resource people.
SA	A	D	SD	Goal statements were appropriate for the grade/age level.
SA	A	D	SD	Activities in the Unit were effective in helping students attain stated goals.
SA	A	D	SD	Experience with this Unit has caused me to (or will) modify other courses I teach.
SA	A	D	SD	Cost and availability of materials necessary to teach this Unit have been a problem.
SA	A	D	SD	Most of my students were enthusiastic about the Unit.
SA	A	D	SD	The Unit was easy to relate to the subject area I taught it in.
SA	A	D	SD	The Unit is a valid environmental education activity.

The next five statements refer to the parts of the Unit.

SA	A	D	SD	The Introduction was adequate.
SA	A	D	SD	The Goal statements were clear.
SA	A	D	SD	The Activity Description was adequate.
SA	A	D	SD	The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)
SA	A	D	SD	The Evaluation part was useful.

Open-Ended Items

This part is to ask you for advice and suggestions specific to this Unit. Please provide as much detail as you can. Your comments in this section are especially important to us.

What changes would you recommend in this Unit before it is taught again?

What tips and hints do you have for others who may be teaching the Unit? (i.e., equipment, teaching strategy, resource people, etc.)

List materials you have used in addition to those recommended by the Unit.

Please feel free to make any further comments about this Unit, environmental education, in general, or any other related topics. Thanks for your time and effort.

State of Minnesota

Department of Education
Capitol Square, 550 Cedar Street
St. Paul, Minnesota 55101

Dear Student:

You have just completed a Unit in Environmental Education. The Unit is newly developed. The following questions are to help us get an idea of how it worked. Your comments and suggestions will be very helpful to us. They will be held in strict confidence.

Please complete the form and seal it in the envelope. Remember, your help is vital. Return it to your teacher. He or she will return it to me.

Sincerely,

John C. Miller

John Miller, Consultant
Environmental Education
Minnesota Department of Education

. . . .

ENVIRONMENTAL EDUCATION
STUDENT SURVEY

What is the title of the Unit you have just completed? ____________________

____

What grade are you in? ______________ grade

Do you feel that the Unit was worthwhile to you? Yes___ No___ Don't Know___

Would you recommend it to friends of yours? Yes___ No___ Don't Know___

Did you like the Unit? Yes___ No___ Don't Know___ Please explain your answer

____

____

____

____

Would you recommend changes in the Unit? Yes___ No___ Don't Know___
Please explain your answer ____________________________________

____

____

____

APPENDIX C

SUMMARY OF TEACHER USE OF RESOURCE PEOPLE, PLACES, AND ADDITIONAL MATERIALS IN THE UNIT FIELD TESTING

SUMMARY OF INDICATED TEACHER USE OF RESOURCE PLACES WITH THE UNITS

	RESOURCE PLACES								
Unit	School site		Community		Regional		Other		Total Number Testing Unit
	#	%	#	%	#	%	#	%	
A classroom newspaper	7	78	5	56	3	33	2	22	9
It's your decision	6	75	0	0	1	13	0	0	8
Environmental Magazines	8	100	0	0	0	0	0	0	8
Growing Environmental crisis	10	83	1	8	0	0	0	0	12
Pollution: Cause and Effect	9	69	1	8	1	8	1	8	13
Environmental Halo	5	100	0	0	0	0	0	0	5
Pollution and waste	6	75	3	38	0	0	1	13	8
Energy Crisis	15	79	1	5	0	0	2	11	19
Energy and the Individual	13	93	1	7	0	0	0	0	14
Orienteering	1	33	0	0	0	0	1	33	3
What is it?	1	50	0	0	1	50	0	0	2
New Things	3	75	2	50	0	0	1	25	4
Student Interest	3	60	1	20	0	0	2	40	5
Recreational Vehicles	11	92	0	0	0	0	1	8	12
Wilderness	7	100	0	0	0	0	1	14	7
Mystery Walk	6	46	6	46	2	15	0	0	13
How do you feel?	15	56	20	74	2	7	2	7	27
Phosphorus Leaks	8	62	9	69	4	31	0	0	13
Create a Mammal	19	63	5	17	1	3	3	10	30
Interstate Highway	14	61	5	22	1	4	2	9	23
Interdependency	4	67	0	0	0	0	0	0	6
Our Desire for a Better World	5	100	0	0	0	0	0	0	5
A Different perspective	8	89	4	44	0	0	0	0	9
Mother of the Year	13	81	3	19	1	6	0	0	16
Cemetary	2	22	9	100	1	11	0	0	9
We Would Like to do Something	4	100	0	0	0	0	0	0	4
TOTAL	203	71%	76	27%	18	6%	19	7%	284

SUMMARY OF INDICATED TEACHER USE OF RESOURCE PEOPLE WITH THE UNITS

	RESOURCE PEOPLE										
	Education People		Community People		Natural Resource People		Other		Didn't Use		Total Number Testing Unit
Unit	#	%	#	%	#	%	#	%	#	%	
A Classroom Newspaper	4	44	5	56	2	22	2	22	2	22	9
It's Your Decision	0	0	0	0	0	0	0	0	8	100	8
Environmental Magazines	4	50	0	0	0	0	0	0	4	50	8
Growing Environmental Crisis	3	25	1	8	1	8	0	0	9	75	12
Pollution: Cause and Effect	4	31	0	0	0	0	1	8	9	69	13
Environmental Halo	0	0	0	0	0	0	0	0	5	100	5
Pollution and Waste	2	25	3	38	1	13	1	13	4	50	8
Energy Crisis	0	0	2	11	0	0	1	5	16	84	19
Energy and the Individual	1	7	2	14	2	14	2	14	9	64	14
Orienteering	1	33	0	0	0	0	0	0	2	67	3
What Is It?	0	0	0	0	0	0	0	0	2	100	2
New Things	0	0	0	0	0	0	1	25	4	100	4
Student Interest	0	0	0	0	0	0	1	20	5	100	5
Recreational Vehicles	3	25	0	0	1	8	1	8	7	58	12
Wilderness	1	14	1	14	0	0	0	0	5	71	7
Mystery Walk	4	31	2	8	0	0	1	8	6	46	13
How Do You Feel?	9	33	14	52	0	0	3	11	11	41	27
Phosphorus Leaks	4	31	3	23	1	8	1	8	5	39	13
Create a Mammal	2	7	1	3	2	7	0	0	25	83	30
Interstate Highway	3	13	1	4	0	0	0	0	9	83	23
Interdependency	1	17	0	0	1	17	1	17	5	83	6
Our Desire for a Better World	0	0	0	0	0	0	0	0	5	100	5
A Different Perspective	2	22	3	33	0	0	0	0	5	56	9
Mother of the Year	2	13	0	0	0	0	0	0	14	88	16
Cemetary	0	0	4	44	0	0	0	0	5	56	9
We Would Like To Do Something	0	0	0	0	0	0	0	0	4	100	4
Total	49	17%	41	14%	11	4%	16	6%	195	68%	284

SUMMARY OF INDICATED TEACHER USE OF INSTRUCTIONAL MATERIALS IN ADDITION TO THOSE OF THE UNIT

Unit	Number & Percent Using Additional Materials Number	Percent	Total Number Testing Unit
A Classroom Newspaper	8	89%	9
It's Your Decision	0	0	8
Environmental Magazines	4	50	8
Growing Environmental Crisis	4	33	12
Pollution: Cause and Effect	5	39	13
Environmental Halo	1	20	5
Pollution and Waste	2	25	8
Energy Crisis	8	42	19
Energy and the Individual	5	39	13
Orienteering	3	100	2
What Is It?	2	100	2
New Things	0	0	4
Student Interest	0	0	5
Recreational Vehicles	1	8	12
Wilderness	1	14	7
Mystery Walk	3	25	12
How Do You Feel?	6	23	26
Phosphorous Leaks	9	69	13
Create a Mammal	12	43	28
Interstate Highway	6	27	22
Interdependency	2	40	5
Our Desire for a Better World	1	20	5
A Different Perspective	4	44	9
Mother of the Year	4	27	15
Cemetary	3	33	9
We Would Like To Do Something	0	0	4
Total	93	34%	275

APPENDIX D

SUMMARY OF STUDENT RESPONSES TO FOUR SCALED ITEMS

DISTRIBUTION OF STUDENT RESPONSES TO THE QUESTION:

The Unit	"Do you like the Unit?"				"Would you recommend changes in the Unit?"			
	Yes	No	Don't Know	N	Yes	No	Don't Know	N
A Classroom Newspaper	85%	5%	10%	74	36%	44%	20%	73
It's Your Decision	76%	17%	7%	29	45%	34%	21%	29
Environmental Magazines	81%	9%	10%	21	57%	33%	10%	21
Growing Environmental Crisis	78%	9%	13%	46	22%	52%	26%	46
Pollution: Cause and Effect	82%	6%	12%	33	36%	30%	34%	33
Environmental Halo	65%	18%	17%	17	53%	18%	29%	17
Pollution and Waste	76%	10%	14%	29	39%	47%	14%	28
Energy Crisis	80%	9%	11%	55	16%	58%	26%	55
Energy and the Individual	80%	5%	15%	39	40%	38%	22%	37
Orienteering	67%	17%	16%	6	83%	0	17%	6
What Is It?	75%	13%	12%	8	14%	14%	72%	7
New Things	58%	9%	33%	12	58%	42%	0	12
Student Interest	70%	20%	10%	10	67%	33%	0	9
Recreational Vehicles	74%	6%	20%	35	32%	54%	14%	35
Wilderness	85%	10%	5%	20	40%	40%	20%	20
Mystery Walk	98%	0	2%	40	63%	27%	10%	40
How Do You Feel?	86%	9%	5%	85	34%	49%	17%	85
Phosphorus Leaks	86%	6%	8%	49	44%	35%	21%	48
Create A Mammal	89%	3%	8%	118	18%	68%	14%	120
Interstate Highway	84%	12%	4%	76	49%	36%	15%	74
Interdependency	82%	0	18%	17	29%	53%	18%	17
Our Desire for a Better World	84%	16%	0	25	39%	52%	9%	23
A Different Perspective	83%	7%	10%	41	39%	39%	22%	41
Mother of the Year	65%	25%	11%	54	47%	34%	19%	53
Cemetary	83%	6%	11%	35	43%	40%	17%	35
We Would Like To Do	86%	14%	0	7	29%	43%	28%	7
TOTALS	82%	9%	9%	981	37%	45%	18%	971

DISTRIBUTION OF STUDENT RESPONSES TO THE QUESTION:

The Unit	"Do you feel this Unit was Worthwhile to you?"				"Would you recommend it to friends of yours?"			
	Yes	No	Don't Know	N	Yes	No	Don't Know	N
A Classroom Newspaper	86%	3%	11%	74	61%	15%	24%	74
It's Your Decision	79%	14%	7%	29	79%	14%	7%	29
Environmental Magazines	81%	9%	10%	21	65%	15%	20%	20
Growing Environmental Crisis	81%	8%	11%	48	71%	10%	19%	48
Pollution: Cause and Effect	91%	9%	0%	32	73%	6%	21%	33
Environmental Halo	53%	29%	18%	17	53%	35%	12%	17
Pollution and Waste	81%	6%	13%	32	71%	19%	10%	31
Energy Crisis	86%	5%	9%	56	66%	9%	25%	56
Energy and The Individual	84%	5%	11%	38	65%	19%	16%	37
Orienteering	67%	33%	0%	6	67%	33%	0%	6
What Is It?	67%	11%	22%	9	67%	22%	11%	9
New Things	29%	21%	50%	14	43%	43%	14%	14
Student Interest	80%	20%	0%	10	80%	10%	10%	10
Recreational Vehicles	83%	11%	6%	35	69%	11%	20%	35
Wilderness	80%	10%	10%	20	70%	10%	20%	20
Mystery Walk	90%	3%	7%	40	75%	7%	18%	40
How Do You Feel?	83%	11%	6%	85	68%	11%	21%	85
Phosphorus Leaks	88%	6%	6%	49	74%	12%	14%	49
Create a Mammal	87%	7%	6%	121	67%	12%	21%	120
Interstate Highway	91%	4%	5%	74	75%	12%	13%	76
Interdependency	82%	6%	12%	17	65%	6%	29%	17
Our Desire for a Better World	80%	12%	8%	25	80%	12%	8%	25
A Different Perspective	83%	5%	12%	41	59%	7%	34%	41
Mother of the Year	57%	24%	19%	54	54%	24%	22%	54
Cemetary	74%	17%	9%	35	46%	17%	37%	35
We Would Like to Do	71%	0%	29%	7	71%	14%	14%	7
TOTALS	82%	9%	9%	989	67%	14%	19%	989

APPENDIX E

INDIVIDUAL UNIT FIELD TEST DATA

The Unit: A CLASSROOM NEWSPAPER

Use of resource people and places in the 9 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	4	44%
Community	5	56
Natural Resource	2	22
Other	2	22
I didn't use any	2	22
Places		
School site	7	78%
Community	5	56
Regional	3	33
Other	2	22

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	8	89%	1	11%
The Goal statements were clear	7	78	2	22
The Activity Description was adequate	9	100	0	0
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	1	100	0	0
The Evaluation Part was useful	6	67	3	33

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	3	33%	6	67%
I would teach this Unit again	6	67	3	33
I think this Unit depends on the use of sites	4	44	5	56
I think this Unit depends on the use of resource people	5	56	4	44
Goal statements were appropriate for grade/age level	8	89	1	11
Activities in the Unit were effective in helping students attain stated goals	8	89	1	11
Experience with this Unit has caused me to (or will) modify other courses I teach	3	38	5	62
Cost and availability of materials necessary to teach this Unit have been a problem	0	0	9	100
Most of my students were enthusiastic about the Unit	8	89	1	11
The Unit was easy to relate to the subject area I taught it in	7	78	2	22
The Unit is a valid environmental educational activity	8	89	1	11

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	8	89%

The following are some of the additional materials that were used in the trial testing of this Unit:

My own media unit.

Examples of newspapers.
Camera and developing equipment.
Typewriters (we used eight).
Ditto masters and paper.
Telephone to obtain appointments for interviews.
Phone books for names and addresses.

Several texts on environmental issues -- alternative energy sources, etc.

As a lead-up to environmental Unit, we did a landscape Unit, stressing awareness.

Duplicating machine.
Polaroid camera.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

It needs much more time than I am willing to spend on a newspaper. I have other obligations in the classes I teach.

This unit requires a great deal of extra time on the part of the teacher. I would recommend that the teacher who does this Unit realizes the time involved and be given a realistic deadline. The Unit assumes a lot. For example, it assumes that eighth graders (or even other levels) know how to go about the preparation and production of a newspaper.

I think that any changes or additions can easily be made by the teacher. One may add a chain of command chart as I did.

Watch out that you don't ask questions you already have answers to. For example: "What should be the role of the teacher? Advisor? What is an advisor?" Why ask?

I would suggest you limit the scope - also watch the subject matter. The suggested Unit was not appropriate for my field.

Activity improves with experience.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Figure out a way to get the students outside!

Teachers were asked to make any *free comments* relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> Why on earth in a supposed *environmental* education paper or project are the students *indoors?* It seems that in English there are *many* opportunities to go *outside* and study and write about the environment. It seems absurd to keep them *inside* for all the Units.
>
> This Unit took 12 English session of 63 minutes each. There is a possibility it could have been done in 2 or 3 less hours but it is doubtful. They produced a 19-page paper that included an editorial page, letters, interviews, articles, book reviews, movie reviews, jokes, cross-word puzzles, cartoons, environmental test, and poetry. We have 20 tenth graders and they learned a lot with this unit. It was very successful.
>
> It is a must that students know the parts of a newspaper and how journalistic writing differs from other kinds of writing. It is also necessary that the students know what ecology is and most importantly that they are willing to *live* what they *print*! Another thing I did was cut the size of the paper by printing only half the number of copies needed for the student body. This saved on paper and labor time. Simply print: save paper, share this newspaper with a friend. This emphasizes the fact that ecology and conversation are related.
>
> I used a contract (attached) system. The students signed a contract with a first and second job choice and were evaluated on a pass/fail basis. The only restrictions on the job were the editor positions. They were required to have the same study hall hour as my preparation period so we could meet often for planning.
>
> Let the kids decide everything - they seem to have more enthusiasm when they do.
>
> Teach a chain of command and STICK to it.
>
> Make sure you clear everything with administration.
>
> Let the kids do the newspaper and keep your hand out of it as much as possible. Let them make decisions.
>
> Get advice from a teacher that has had experience as advisor for a school newspaper.

(1) important to get everyone involved
(2) be sure that your editor is a responsible leader
(3) allow plenty of time to produce the paper
(4) persuade your letter writiers to write for the paper!

This was O.K.! The problem is defining "environment." What is it? Birds, etc. Our newspaper covered the school as an environment.

The students enjoyed producing an environmental newspaper very much. They set their goals before starting the project and I feel that most of their goals were met. Because of this unit I think that they have become more aware of their environment, its needs, and have become concerned with the struggle to help and improve the wild inhabitants of our environment.

Student Feedback	Number	Percent
Number of students responding	74	100%
Number and percent of students who thought this Unit was worthwhile	64	86%
Number and percent who would recommend this Unit to friends	45	61%

DISTRIBUTION OF STUDENT EXPRESSIONS
OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	63	85%
No, I did not like it	4	5%
Don't know	7	10%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

It was interesting.

It was different.

It made me think of the environment.

I now have an understandling of how. . . to get a newspaper published.

I learned a lot about the ecological system.

. . . made me realize that we should get to work to clean up our planet.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	26	36%
No	32	44%
Don't know	15	20%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

> The class should go deeper into the subject.
>
> . . . the teacher should consider individual talents more carefully before assigning jobs.
>
> More time.
>
> Good the way it was.

The Unit: IT'S YOUR DECISION

Use of resource people and places in the 8 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	0	0
Natural Resource	0	0
Other	0	0
I didn't use any	8	100
Places		
School site	6	75%
Community	0	0
Regional	1	13
Other	0	0

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	8	100%	0	0%
The Goal statements were clear	8	100	0	0
The Activity Description was adequate	6	86	1	14
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	5	83	1	17
The Evaluation Part was useful	6	75	2	25

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	4	57%	3	43%
I would teach this Unit again	5	71	2	29
I think this Unit depends on the use of sites	1	14	6	86
I think this Unit depends on the use of resource people	1	14	6	86
Goal statements were appropriate for grade/age level	5	71	2	29
Activities in the Unit were effective in helping students attain stated goals	5	71	2	29
Experience with this Unit has caused me to (or will) modify other courses I teach	3	43	4	57
Cost and availability of materials necessary to teach this Unit have been a problem	0	0	7	100
Most of my students were enthusiastic about the Unit	3	50	3	50
The Unit was easy to relate to the subject area I taught it in	4	57	3	50
The Unit is a valid environmental educational activity	6	86	1	14

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	0	0%

The following are some of the additional materials that were used in the trial testing of this Unit:

I used the need aspects of human behavior which is a part of my speech curriculum.

We mostly used articles from various magazines and personal observations of those participating.

Media center and magazines.

Conduct an awareness campaign before the unit to aid the students in becoming knowledgeable of various environmental issues.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

> The unit itself seems fine. I think it is not particularly well-adapted to the 8th grade age level.
>
> Changes in instruction - difficult to determine if the decision was reaction of friends, family, etc., to environmental problems or was it the student decision about those same problems.
>
> The unit is adequately structured.
>
> I can't get this unit finished in an hour. There has got to be a more efficient way to chart this. By the time we finished the hour was up and there were not many conclusions drawn. The words "positive" and "negative" have an unwanted connotation.
>
> Listen! It took two days to have the students understand what the three types of decisions are. This unit requires more time.
>
> The master charting process suggested was too time consuming and tedious. To implement unit in one period, some cutting was necessary.
>
> After discussion, evaluation questions were rather weak.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> If class discussion is to be used, limit the number of problems identified to 4 or 5 so it is possible to discuss each problem.
>
> Make it part of regular units that deal with decisions and/or relationships.
>
> Clarify terms used in environmental discourse and emphasize the fact that something may actually be done in relation to their decisions.
>
> I think if I were to use this unit on my own, I would have students fill out their charts one day. Transfer the results out of class and discuss the chart the next day.
>
> The environmental issues discussed have to center around the students' environment. Other issues are vague, detached and meaningless.
>
> Do a little research yourself before you jump head first into the unit.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> To many students, environmental education is a matter of "whats the use?" Many students feel somewhat apathetic in relation to corporate pollution because of the red tape involved in stopping it. A lot of students commented: "What is the sense of studying environmental education when pollution laws are so slack and courts are hesitant to enforce them!"
>
> I did try a little discussion with one section the next day and for these students the unit seemed to lead somewhere.
>
> I received two choices for units "It's Your Decision" and "Environmental Magazines." I combined them. In order to decide on environmental issues, one has to define them; the best way here was with the magazines in the Instructional Media Center. One point: These were nice projects but our students are so sick of environmental education that they are negatively affected.
>
> Teach this to the parents and voters of the community.
>
> The unit has potential, but giving a teacher a two-week span to fit it into is unrealistic. Relevancy would be better at another time.

Student Feedback	Number	Percent
Number of students responding	29	100%
Number and percent of students who thought this Unit was worthwhile	23	79%
Number and percent who would recommend this Unit to friends	4	14%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes I liked it	22	76%
No, I did not like it	5	17%
Don't know	2	7%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

It's boring.

It made me stop and think.

Hard to judge others.

A waste of time. You hear things like that everyday.

Yes, but other problems are just as important.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	13	45%
No	10	34%
Don't know	6	21%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Make it more exciting.

More depth.

Lead some place more definite.

Do more work together.

Pretty good the way it was.

Wording a little confusing for the 8th grade.

The Unit: ENVIRONMENTAL MAGAZINES

Use of resource people and places in the 8 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	4	50%
Community	0	0
Natural Resource	0	0
Other	0	0
I didn't use any	4	50
Places		
School site	8	100
Community	0	0
Regional	0	0
Other	0	0

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	7	88%	1	12%
The Goal statements were clear	8	100	0	0
The Activity Description was adequate	6	75	2	25
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	3	100	0	0
The Evaluation Part was useful	7	88	1	12

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	2	25%	6	75%
I would teach this Unit again	8	100	0	0
I think this Unit depends on the use of sites	1	13	7	87
I think this Unit depends on the use of resource people	3	38	5	62
Goal statements were appropriate for grade/age level	7	88	1	12
Activities in the Unit were effective in helping students attain stated goals	6	75	2	25
Experience with this Unit has caused me to (or will) modify other courses I teach	3	38	5	62
Cost and availability of materials necessary to teach this Unit have been a problem	0	0	7	100
Most of my students were enthusiastic about the Unit	5	71	2	29
The Unit was easy to relate to the subject area I taught it in	5	62	3	38
The Unit is a valid environmental educational activity	8	100	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	4	50%

The follwoing are some of the additional materials that were used in the trial testing of this Unit:

We used only several editions of the magazine.

I used magazine titles not listed in the unit, especially in the recreation field. There I had: Camping Journal, Canoe, Wilderness Camping, Bow and Arrow.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

The Environmental Ethic Statement is written in too "heavy" language. The students needed a great deal of help to understand it.

I would allow more time than I had. At least 7 - 8 hours.

The students had a hard time understanding the activity description. Please revise and explain clearly what is meant by environmental ethics, give example of a magazine's ethical point of view.

Instructions might mention that students should be encouraged to select a variety of magazines. I was not aware of this until I suddenly had 3 groups starting work on the same magazine.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> I used a writing assignment to get the students to verbalize their own Environmental Ethic. We did this right after the unit. It seemed effective.
>
> I would suggest role-playing as an introduction to points of view.
>
> Give enough time for the study of the magazines.
>
> Conservation officers or ecologists use field trips to newspaper office (editor).
>
> Some idea of time span would be useful. I used 4 2hour periods.
>
> 1. Allow more time than I did (2 weeks).
>
> 2. Have more magazines available for analysis than were available to us. At least 8 different environmental magazines should be available.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> I like this unit. It is easily related to the English area. I think it fills a void in the reading program, while it makes students formulate their opinions on the environment. We "teach" kids how to read novels, short stories, plays, etc., but no one "teaches" them how to critically read a magazine--the one thing that the majority of them will read throughout life.
>
> This is quite an abstract idea for many students to grasp. It sounds like a good college level unit. I had a lot of "ground" work to do as most of the students did not understand the word ETHICS. A good many adults do not either!
>
> Very good - I think these units are excellent and I enjoyed them. I really didn't take the time to be as creative as I can be, but I will be when I do these again.
>
> I don't feel that teachers in general, except maybe the biology area, physics or chemistry instructors are knowledgeable enough to do an adequate job of teaching EE.
>
> We could use courses in EE or else a community workshop in this area.
>
> The industry-oriented magazines are needed in this unit to illustrate how subtle their approach is to the very environmental problems that their interests cause. Holiday does this a little bit. Also I had a magazine put out byBank of America called the Environmental Handbook, apparently not a regular publication, that was very industry-oriented, but very subtle about it.
>
> Environmental education must be blended into the curriculum rather than being offered in obvious lumps. The testing situation had many drawbacks since the units had to be handled within a time limit when these units weren't always applicable.
>
> Students were bombarded, too, as some had environmental units in three classes.
>
> Most of the students who studies this unit were very naive as to what our environment is, how it affects us, how we affect it, etc.
>
> The unit was most worthwhile, in that it made them more aware of environment, its problems, and our responsibility toward our environment.

Student Feedback	Number	Percent
Number of students responding	21	100%
Number and percent of students who thought this Unit was worthwhile	17	81%
Number and percent who would recommend this Unit to friends	13	65%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	17	81%
No, I did not like it	2	9%
Don't know	2	10%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Made me realize things that are happening.

Gives the broad view of the environment.

Gave the opportunity to explore.

It was fun. I thought it would be boring.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	12	57%
No	7	33%
Don't know	2	10%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

More individual work.

More time.

Okay.

Too rushed.

Don't force it on students. Ask them.

The Unit: GROWING ENVIRONMENTAL CRISIS

Use of resource people and places in the 12 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	3	25%
Community	1	8
Natural Resource	1	8
Other	0	0
I didn't use any	9	75
Places		
School site	10	83%
Community	1	8
Regional	0	0
Other	0	0

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	10	83%	2	17%
The Goal statements were clear	11	92	1	8
The Activity Description was adequate	11	92	1	8
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	5	71	2	29
The Evaluation Part was useful	10	83	2	17

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	0	0%	12	100%
I would teach this Unit again	12	100	0	0
I think this Unit depends on the use of sites	2	17	10	83
I think this Unit depends on the use of resource people	2	17	10	83
Goal statements were appropriate for grade/age level	11	92	1	8
Activities in the Unit were effective in helping students attain stated goals	9	75	3	25
Experience with this Unit has caused me to (or will) modify other courses I teach	5	42	7	38
Cost and availability of materials necessary to teach this Unit have been a problem	0	0	12	100
Most of my students were enthusiastic about the Unit	11	92	1	8
The Unit was easy to relate to the subject area I taught it in	6	50	6	50
The Unit is a valid environmental educational activity	12	10	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	4	33%

The following are some of the additional materials that were used in the trial testing of this Unit:

Articles we were role-playing.

Desk maps.
Bulletin board materials on conservation.

None. We did, however, use "By the Waters of Babylon."

There was not time to use any. Blackboard to list the occupations of the members.

Very little needed on this unit.

None - Lack of prep time.

Any magazine articles dealing with current pollution problems today.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

I would have used pictures instead of words.

I thought it was pretty much self-contained. I don't know that implementation of any new changes would increase the value of the unit, unless, of course, it is to broaden the unit somehow.

I enjoyed this unit. I feel it had enough student activity which they could "really get into." Short stories, excerpts from novels, poems or plays which deal with relocation--one(s) which they can understand--would definitely add.

My students responded very well to the unit. I think it would be made longer, perhaps involving resource people and even role-playing problems arising after forming the new community.

Need three class periods.

With a class of any size (15-30) discussion about the kind of community and where they will locate will take much longer than 10 minutes! I divided the class into small groups but for them to arrive at a good decision takes more time and more values need to be clarified.

Part 5 - Activities - A problem of favorite friends vs. analysis of situations.

Minnesota is a large enough area to explore.

Change in age/grade level taught--show monies or other visual aids to get interest in our environment. Take field trips to dumps, walk in woods, check city streets, visit places where air, water, solid wastes are problems, etc.

Do it in September, not November.

Use more time.

I rebuilt the introduction into a story that led into the activity.

More ideas at beginning to set the ground rules, example: Are cars available? Is there gas? Will there be gas? I put these rules down as we went along, etc.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> I would set up with the students a miniature environment along with the role-playing. Students "love" to handle things.
>
> We could not find the short stories...I feel they may have added more understanding.
>
> All students should have desk (ditto) maps.
> Break into small groups.
>
> I might invite a speaker to perhaps emphasize the "crisis" we do have in environmental concerns for motivation. My students were quite well informed, however.
>
> Be sure the class knows how to role-play. Some students cannot forget the personality or real person of the other or themselves.
>
> Include the option of having each student choose the community makeup.
>
> Ditto maps of North America and have students block off areas first, then go to the large map. Create a feeling of loss of home, maybe teach unit in place where their real lives are far back in their minds, example in the woods, deserted run-down house, parking lot, etc. Local people such as a mayor, city engineer, garbage men, etc., would be helpful.
>
> An aura of excitement and urgency gets the students into the activity with a great deal more enthusiasm.
>
> I think you should know what can be done and cannot be done during the move (time to get there) (what travel will be used) (Is the water bad), etc.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> A very good and a fun unit. The student certainly became aware of interdependence.
>
> I do feel more positive about the elected unit. I seemed more able to orient myself to it as well as the students. It was quite interesting to character emerge from students who had never displayed such.
>
> I will include this as part of my SCIENCE FICTION unit.
>
> What is meant by the statement "...what kind of a community they will want to form."?
>
> Enjoyed it.
> Students loved it.
>
> I enjoyed doing the unit and feel the students did too. It gave us all more awareness to the problem. Students are very concerned with the environment and how we all can make the situation better.
>
> I like this unit very much. But when I do it again I will have to make discussion ground rules and give enough time for the students to work through the problems that arise in trying to form a community.
>
> This unit raises more questions than it answers and that is good in my opinion. I'm convinced that we should spend more time raising the right questions than having a set of answers for kids to memorize or accept.
>
> This unit was good but more information preceding the material about type of things to be done would have been most helpful.
>
> Most teachers using the units felt they wanted more prep time or wanted to wait as they had a place where their unit would fit neatly into their regular course.

Student Feedback	Number	Percent
Number of students responding	48	100%
Number and percent of students who thought this Unit was worthwhile	39	81%
Number and percent who would recommend this Unit to friends	34	71%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	36	78%
No, I did not like it	4	9%
Don't know	6	13%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

> It was stupid. Something like that will never happen.
>
> Not interesting.
>
> It was fun.
>
> We were all involved.
>
> It was difficult.
>
> Made me realize how everything is dependent.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	10	22%
No	24	52%
Don't know	12	26%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

It's okay.

Interesting.

It should be longer.

More detail.

The Unit: POLLUTION: CAUSE AND EFFECT

Use of resource people and places in the 13 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	4	31%
Community	0	0
Natural Resource	0	0
Other	1	8
I didn't use any	9	69
Places		
School site	9	69%
Community	1	8
Regional	1	8
Other	1	8

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	12	92%	1	8%
The Goal statements were clear	11	85	2	15
The Activity Description was adequate	12	92	1	8
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	4	80	1	20
The Evaluation Part was useful	11	85	2	15

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	3	23%	10	77%
I would teach this Unit again	11	85	2	15
I think this Unit depends on the use of sites	0	0	13	100
I think this Unit depends on the use of resource people	3	23	10	77
Goal statements were appropriate for grade/age level	9	69	4	31
Activities in the Unit were effective in helping students attain stated goals	11	85	2	15
Experience with this Unit has caused me to (or will) modify other courses I teach	5	42	7	58
Cost and availability of materials necessary to teach this Unit have been a problem	1	8	12	92
Most of my students were enthusiastic about the Unit	9	75	3	25
The Unit was easy to relate to the subject area I taught it in	9	69	4	31
The Unit is a valid environmental educational activity	13	100	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	5	39%

The following are some of the additional materials that were used in the trial testing of this Unit:

If using Mod Earth Sci (Holt, Rinehart, Winston), it fits best into pages 500-501.

Film - Conserving Our Environment - The Pollution Crisis,
Coronet Film

Film - Pollution - From Defense Civil Preparedness Agency

"Man and Nature" - A slide set from Center for Humanities

"This Land is Your Land" - An Environmental commentary from Perfection Form Co.

None in assigned unit.

I would have used and been glad for any additional information, but because of a time shortage, I didn't find any.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

> It was done before discussing what occupations were important. Trying it after occupational importance to the community was discussed would be interesting.
>
> Needed more materials and specific information.
>
> More diversified activities.
>
> Field trips to actual sites or problems of water, air, etc., pollution.
>
> When using the evaluation, if you assume statement 4 did occur, which is suggested, then you eliminate all possibilities. Evaluation should include N - no change
> X - couldn't do at all
> C - would require a change
>
> A better description of hour to assess the activity areas on the evaluation sheet.
>
> One problem for me is lack of time to do a really effective job. It's impossible for me, now, to dig up supplementary materials or resource people. The discussion questions were much too vague and really made for difficult, unstimulating discussion.
>
> Include suggestions for supplementing the unit with extra, interest arousing activities. Have a bit more for the students to do before discussion - something to get them activated.
>
> Possible film on unit?
>
> Visual stimulation can be great.
>
> Expand it to include more activities like the first one. Needs more punch in the beginning to get them interested.
>
> None; it's open-ended and flexible as is.
>
> I wasn't impressed by the questions. I feel they deal with situations which are above the "maturity level" of most 13 yr. olds. They understood the questions, they understood the directions, but I don't think they could fully comprehend the situation. Example: Only one group realized the problems of vegetation and animal growth due to a lack of oxygen.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Spend some pre-unit.

Photos and articles about air pollution, disease ridden countries, etc.; freeze dried food samples.

If using Mod Earth Sci (Holt, Rinehart, Winston), it fits best into pages 500-501.

I will fit better in a science or social studies class as introductory or follow-up units on environmental problems, possibly a pre-test post-test even.

Resource people would be an asset and possibly examples of existing environmental problems. Students seem to want definite proof, facts, even pictures as evidence. Certainly they are aware, but if you're desires are to make them aware then REALLY MAKE THEM AWARE.

Be sure students understand some of the elements for a good group discussion.

I wasn't as well prepared as I could have been. Be very well prepared!

Find extra resources before beginning unit.

Paper bags--use small ones--preferably airtight. I started the discussion using situations they could identify with--postponing studying for a test, leaving family chores, etc., leaving their work until it was too late--then they feel the "effects." I would suggest a discussion at the end comparing the cause and effect solution of pollution to their own personal cause and effects problems they have encountered.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> Generally, I like the units and am looking forward to having the opportunity to use them again. Some of the units are quite impressive.
>
> I really hate to be negative, yet I feel that too much emphasis is being placed on new ideas, new curriculum, new techniques and too many educators accept these things because they're NEW. That's their only reason. How can you possibly justify incorporation of new material when you have seniors who can't write a simple sentence. Teach them the basic fundamentals of grammar first, see how they apply the basic in composition second, then move on to classical literature with the emphasis on classic lit, nothing else. If, then, the students have learned, now it's time to go on to something different or unique.
>
> Although it was somewhat worthwhile, it was kind of a blah unit. Most students need something more to head for in a discussion--mostly they were asked just to discuss. Perhaps if this were part of a larger unit, it would have been more successful because the students would have been more "into it." I presented it as a short unit in a context completely void of environmental direction.
>
> I would have appreciated a list of periodicals, books, films, etc., available to enhance this unit.
>
> Living in a rural community, it was hard for the students to believe these problems could or do exist.

Student Feedback	Number	Percent
Number of students responding	32	100%
Number and percent of students who thought this Unit was worthwhile	29	91%
Number and percent who would recommend this Unit to friends	24	73%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	27	82%
No, I did not like it	2	6%
Don't know	4	12%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Someday pollution is going to really affect us.

It really makes you think.

It was fun.

Brought attention to the conflict between man and nature.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	12	36%
No	10	30%
Don't know	11	34%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Okay the way it was.

It could be explained a little more.

Should be longer.

Tell us if those statements are fact or just theories.

Filmstrips.

The Unit: ENVIRONMENTAL HALO

Use of resource people and places in the 5 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	0	0
Natural Resource	0	0
Other	0	0
I didn't use any	5	100
Places		
School site	5	100%
Community	0	0
Regional	0	0
Other	0	0

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	3	75%	1	25%
The Goal statements were clear	4	100	0	0
The Activity Description was adequate	4	100	0	0
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	4	100	0	0
The Evaluation Part was useful	4	100	0	0

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	2	50%	2	50%
I would teach this Unit again	3	75	1	25
I think this Unit depends on the use of sites	0	0	4	100
I think this Unit depends on the use of resource people	0	0	4	100
Goal statements were appropriate for grade/age level	3	75	1	25
Activities in the Unit were effective in helping students attain stated goals	3	75	1	25
Experience with this Unit has caused me to (or will) modify other courses I teach	1	25	3	75
Cost and availability of materials necessary to teach this Unit have been a problem	0	0	4	100
Most of my students were enthusiastic about the Unit	2	50	2	50
The Unit was easy to relate to the subject area I taught it in	3	75	1	25
The Unit is a valid environmental educational activity	4	100	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	1	20%

The following are some of the additional materials that were used in the trial testing of this Unit:

> Texaco has a unit on writing TV commercials which was a help in providing some terminology, worksheets for storyboards, etc.

The following is a listing of some of the changes recommended by teachers, before this Unit be taught again:

Not in math area.

I found it difficult to obtain the old magazines to compare.

I would somehow expand it in order to accommodate the TV commercial recording exercise. Because of the shortness of the unit, most people had to try to get their two-hour bloc of TV time in on just one night--too many conflicts for this.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Make sure you get enthusiastic students.

Would be helpful to have videotape of various commercials.

I think it could be expanded to include other propaganda technique in a communications class, and consequently integrating the environmental idea.

I would somehow expand it in order to accommodate the TV commercial recording exercise. Because of the shortness of the unit, most people had to try to get their two-hour bloc of TV time in on just one night--too many conflicts for this.

My class enjoyed the unit and were surprised to see that they were often "caught up" in such advertising appeals.

Generally, we enjoyed the units. Many students felt they might have been aimed at junior high or upper elementary. They seemed to feel that the concepts are being hammered at them time and time again. They are aware, they are concerned (although not as much as they seem to think) and they are ready to act. They want to know what specific things they could do. Perhaps some suggestions (good practical ones) for action could be included at the end of each unit. In this one, for example, encourage students to write letters to advertisers and the media protesting the use of the halo effect for products that are in reality harmful to the environment. Also, boycotts of such products.

I do team teach a summer school course for senior high students in environmental science. I work with the English part of it such as, outdoor literature, creative writing and discussion techniques. I hope to use at least one of these units in such a class this summer.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

- None -

Student Feedback	Number	Percent
Number of students responding	17	100%
Number and percent of students who thought this Unit was worthwhile.	9	53%
Number and percent who would recommend this Unit to friends.	9	53%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	11	65%
No, I did not like it	3	18%
Don't know	3	17%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Didn't get much out of this unit.

Waste of time.

Didn't have anything to do with algebra.

Interesting.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	9	53%
No	3	18%
Don't know	5	29%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Pick our own thing to do.

Spend more time on the topic of the "perfect" community.

Work more on the good advertisements.

Beef it up for older students.

The Unit: POLLUTION AND WASTE

Use of resource people and places in the 8 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	2	25%
Community	3	38
Natural Resource	1	13
Other	1	13
I didn't use any	4	50
Places		
School site	6	75%
Community	2	38
Regional	0	0
Other	1	13

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	8	100%	0	0%
The Goal statements were clear	8	100	0	0
The Activity Description was adequate	8	100	0	0
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	7	100	0	0
The Evaluation Part was useful	6	75	2	25

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	1	13%	7	87%
I would teach this Unit again	6	86	1	14
I think this Unit depends on the use of sites	3	38	5	62
I think this Unit depends on the use of resource people	3	37	5	63
Goal statements were appropriate for grade/age level	8	100	0	0
Activities in the Unit were effective in helping students attain stated goals	7	87	1	13
Experience with this Unit has caused me to (or will) modify other courses I teach	3	38	5	62
Cost and availability of materials necessary to teach this Unit have been a problem	1	13	7	87
Most of my students were enthusiastic about the Unit	6	75	2	25
The Unit was easy to relate to the subject area I taught it in	6	75	2	25
The Unit is a valid environmental educational activity	8	100	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	2	25%

The following are some of the additional materials that were used in the trial testing of this Unit:

The students themselves.

None.

Materials from the Chamber of Commerce.

None.

2 films from Minnegasco.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

Give a suggested list of written resources. Or include more information giving materials.

Take the class to sites where they could see waste--garbage company, school lunch lines, factories--and then discuss the problems of waste in the homes. Students were very defensive of their life styles, especially in the beginning of the exercise.

Sites of obvious waste in homes, communities, industries. Resource persons explain some waste problems and how solved in industry, community, homes, or personally.

The questions in introduction were excellent.

This unit was quite self explanatory and I can find little I would change. There would be other things which could be done but they are the types of things each teacher could add to this basic unit.

I don't think it fits in too well with the health curriculum I use.

Some type of current bibliography.

Add a section on examples of: biodegradeable or no-phosphate detergents. Also of products packaged in PVC; examples of over-packaged goods.

None.

None. Good quick length.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Have students work in groups and purpose what project they are going to do together. And then help them do it.

Resource people stating pollution and waste problems, possible solutions and tested solutions.

Students pick an area, survey own school friends or neighborhood about subject, develop awareness to problem and are they doing something about it.

Make sure terms are clear to students.

My students were outstanding in their enthusiasm toward this unit. This made it a real pleasure to teach. They felt important being part of the EE Option I Project.

The part to bring pictures to school might work just as well if you hand many magazines and passed them out in class. Let the students have time to cut out and discuss pollution.

Colored slides and/or field trip of our own local environment would be useful.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> This unit should include more positive statements about what we can do as alternatives to waste because of our convenience products.
>
> I think we could help students with publicity about project in the newspaper.
>
> Excellent to include from nursery school training on through adult education programs. Run special awareness workshops through adult learning centers in schools, churches, neighborhood gatherings, and other community groups: scouting, youth, children and preschool groups.
>
> I felt this unit was quite well done and easy to use. In the class I used it I didn't have much time to spend but there are many more things which could be done. With an older group of students, it probably would move faster.
>
> Some member of the Project Team was to meet with me, which never did happen. Other teachers in our school did not feel that the materials fit into their subject matter. I would have liked to see them used in these different areas.
>
> Thought it was very good. Had positive response. Will teach your units again on my own accord.
>
> The girls in home ec. 9th grade have told me how they are more conscious now than before and are really making an effort to help.
>
> I thought it was a very good, well thought-out unit. The activities were easy to implement and the students enjoyed them as well as learning from them. Generally, I thought it was excellent.
>
> In our open environment, I think perhaps individual cards which could be utilized by independent study students would be useful--also some art cartoon characters would make it more attractive or limmericks perhaps.

Student Feedback	Number	Percent
Number of students responding	32	100%
Number and percent of students who thought this Unit was worthwhile	26	81%
Number and percent who would recommend this Unit to friends	22	71%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes I liked it	22	76%
No, I did not like it	3	10%
Don't know	4	14%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

We realize all the things we do wrong.

Interesting to see what everyone thought.

Didn't learn what I didn't know before.

Made me more aware.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	11	39%
No	13	46%
Don't know	4	14%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Use both sides of the paper.

More things to do. More detail.

More games.

Stress to do things manually instead of electrically.

Get students more involved.

The Unit: ENERGY CRISIS

Use of resource people and places in the 19 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	2	11
Natural Resource	0	0
Other	1	5
I didn't use any	16	84
Places		
School site	15	79%
Community	1	5
Regional	0	0
Other	2	11

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	17	94%	1	6%
The Goal statements were clear	17	94	1	6
The Activity Description was adequate	18	100	0	0
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	14	88	2	12
The Evaluation Part was useful	16	89	2	11

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	3	18%	14	82%
I would teach this Unit again	16	89	2	11
I think this Unit depends on the use of sites	2	11	16	89
I think this Unit depends on the use of resource people	1	6	17	94
Goal statements were appropriate for grade/age level	17	94	1	6
Activities in the Unit were effective in helping students attain stated goals	14	82	3	18
Experience with this Unit has caused me to (or will) modify other courses I teach	15	83	3	17
Cost and availability of materials necessary to teach this Unit have been a problem	2	11	16	89
Most of my students were enthusiastic about the Unit	17	94	1	6
The Unit was easy to relate to the subject area I taught it in	15	83	3	17
The Unit is a valid environmental educational activity	18	100	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	8	42%

The following are some of the additional materials that were used in the trial testing of this Unit:

Had a food lab that they planned. Then they had to figure how much energy they consumed (watts) and if they could have conserved. Instead of using electric mixer, could they have done it by hand.

Text for class.

None.

Current materials - students gave a lot in this regard.

Class materials for consumer course.

None.

List of average cost, house appliance and wattage.

None.

None.

None.

Used only the unit.

Current news and periodicals.

Survey of friends and relatives as to use of appliances. Case study of two families.

The following is a listing of some of the changes recommended by teachers, before this Unit be taught again:

For senior high students the game rules and mechanics are too simple.

More time. Specific students assigned to certain areas (home, business, etc.).

Nothing. Very good.

Some type of bibliography.

No changes as I see them.

Nothing of any significance. Was easy to use and the students like the game and the checklist. The checklist especially was good in that it made these seventh graders think about need for the appliances.

Simpler directions for the game rules - confusing.

None.

Perhaps an explanation of what a watt is, how a meter is read, etc.

See below and could you make some more specific suggestions for resources - people, articles, films, etc.

None that I can think of.

This could be taught in a home ec. class after study has been done on electrical appliances.

There are too many directions on the appliance checklist, too many checks, stars, etc. - It's confusing.

Some appliances are seasonal.

Changes recommended......

My class was an all boy class which is often disruptive so I had a few problems. Next time I would use heavier markers rather than paper because they blew each others markers around.

There are quite a few appliances which should be added to the checklist, otherwise might be forgotten by students--electric shavers, hair curlers, blow combs, shaving lather warmers, electric ice cream makers, electric knives, electric scissors, make-up mirror, electric pencil sharpener.

Activities were too elementary.

In the question discussion the appliance list, perhaps the question could be changed to the option of the instructor using 3, 4, 5 or more rather than asking those who owned 2 or more of the appliances. This would allow for more flexibility to individual areas.

No.

Possibly this unit could contain another activity of a game nature. The students had the most positive reaction toward the game and asked to play it several times after we finished the unit. Also, directions for the game should be more complete.

The Bulb game is simple for 7th graders.

Have game on permanent cards. The students really enjoyed this.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Incorporated more information on the game landing squares.

The game is effective the first time around but not the second.

I firmly believe that the teacher's enthusiasm is all important. Students will "pick" this up.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

Not given out in advance--to plan into my unit.

I would like to use this unit in my other area of home economics to see how the students would respond. I did use these two units with two biology classes each having about 22 students.

Timely. Appropriate.

These units could be worked into other parts of the H.E. curriculum quite well and would be good. There definitely is a need for this sort of thing.

Was very surprised to find out that many of the families around our area have duplicated (2-3) of the same appliances in their homes. Example: 2 large freezers, 2 sewing machines.

I didn't feel the first goal (terms) was achieved by the unit alone. If I were to do it again I would spend more time and go into this in greater depth with the students. The general response I've received from several students is that the unit really made them think - which I think is fantastic. We really had some exciting discussions and the students wanted to start collecting papers for the recycling center. In one class we made a contract to give up one appliance which we really use only for comfort. The kids have also told me they would spend more time on the units and provide more supplementary information (resource speaker). I think the results of the unit were good in that there was a behavior change and excitement and concern expressed by students.

Students really enjoyed the game and questionnaire.

In some situations there were questions as to how one could enter the home stretch and win the game. (e.g., must one roll the exact number in order to advance to the "Big Bulb" and land on the space "Enter Here" and advance directly up to "Bulb.") The evaluation may be further effective by having the students each formulate a "plan" for future action that they could carry out on their own on a regular basis.

Some students thought the "Energy Efficient" Game was elementary, but most enjoyed playing it.

9th grade students enjoyed the game!

More in this field is needed.

We found that when students were doing the appliance checklist, those who could check the most were achieving status while those who checked fewest were embarrassed that they "didn't have as much." We tried various ways in our discussion to have them see differently but with seemingly little success. Perhaps if this were used in a home ec. class, the activity could be to compare wattage of all the appliances and then choose the fewest appliances with the lowest wattage to get the jobs done. Maybe this could be done in small groups with each group working on one job--e.g., 1) laundry, 2) cooking meals, etc.

The idea of carrying on activity over a week's time with work to be done everyday outside of class isn't too successful. Too many forget.

In re the Action Sheet - Page 3 -
Too many of these actions, the kids could do nothing about without provoking their parents. Can you see a 7th grader turning down a thermostat or putting away an appliance? Therein lies the problem with this whole unit. With the exception of a few appliances (toys, hairdriers, toothbrushes, etc.) children don't have too much say (in a good share of the homes anyway) about what a family buys or uses. It would be much better to have activities that deal specifically with what students can do.

I think this unit has much merit, especially with a good follow-up discussion after playing the game. A more orderly or mature class than I used for the testing of these materials would probably enjoy this technique. I intend to incorporate it into my housing unit with my ninth graders.

Student Feedback	Number	Percent
Number of students responding	56	100%
Number and percent of students who thought this Unit was worthwhile	48	86%
Number and percent who would recommend this Unit to friends	37	66%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	44	80%
No, I did not like it	5	9%
Don't know	6	11%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Different.
Helped me and my family to save on energy.
Seemed kiddish.
Boring.
Made me think.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	9	16%
No	32	58%
Don't know	14	26%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Maybe a better film.
More detail for older kids.
Have students try to get along without TV for a week.
Could have been longer with more student involvement.

The Unit: ENERGY AND THE INDIVIDUAL

Use of resource people and places in the 14 trial tests of the Unit

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	1	7%
Community	2	14
Natural Resource	2	14
Other	2	14
I didn't use any	9	64
Places		
School site	13	93%
Community	1	0
Regional	0	0
Other	0	0

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	12	86%	2	14%
The Goal statements were clear	14	100	0	0
The Activity Description was adequate	13	100	0	0
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	11	92	1	8
The Evaluation Part was useful	10	83	2	17

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	4	29%	10	71%
I would teach this Unit again	11	79	3	21
I think this Unit depends on the use of sites	2	14	12	86
I think this Unit depends on the use of resource people	2	14	12	86
Goal statements were appropriate for grade/age level	11	85	2	15
Activities in the Unit were effective in helping students attain stated goals	10	77	3	23
Experience with this Unit has caused me to (or will) modify other courses I teach	9	64	5	36
Cost and availability of materials necessary to teach this Unit have been a problem	2	14	12	86
Most of my students were enthusiastic about the Unit	9	69	4	31
The Unit was easy to relate to the subject area I taught it in	9	64	5	36
The Unit is a valid environmental educational activity	18	100	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	5	39%

The following are some of the additional materials that were used in the trial testing of this Unit:

Film "Gifts" - Environmental Protection Agency

None.

None.

Discussion from students: What types of energy do I use?
What types of energy do I need?
Do I waste?
How do I save?

Where can I find out about this subject matter?

None available at this time.

Libraries helped set up display of books, magazines, and pamphlets related to the energy crisis. Spent half an hour looking at and discussing all the sources of information on the energy crisis.

Materials explaining natural monopolies and why they exist, their benefit to the consumer.

None. I had ordered a film "Environmental Education - A Beginning" from the U.S. Office of Education to be shown at the beginning of these units, but the unit materials didn't arrive at the scheduled time, so didn't show it to the class.

Pamphlets - background from college classes. Community correspondence.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

Again, I don't think this fits in well with the health curriculum I use.

The addition of more voting questions is recommended. The students enjoyed doing this activity and discussion was stimulated between questions. This unit as compared to the previous assigned unit lacked the depth of the assigned unit. In the assigned unit, the student himself was more involved in the learning process. Several activities in the unit seem to define the concept of an energy crisis more clearly. In this unit the students were undecided in relationship to the activities carried out.

Give references for other readings which could be used with the unit.

Possibly include a proposed time schedule for each activity. We may not have done justice by too little time or too much time on certain parts.

Include it in unit how selecting a home and its furnishings. Our quarter had ended where we taught 2 of these classes.

Perhaps "feeling" the kids out more on what they are doing now to conserve energy, what they could do as a group.

Maybe some suggestions for discussion questions would be helpful.

An explanation of values clarification and decision making for those unfamiliar with these concepts.

Change the introduction to be more student oriented.

Revise following questions:
Thumbs Up or Down
Question 1

Students in junior high have little idea of what it's like to live alone. Many people have TV on all the time whether or not anyone is watching so perhaps question could be reworded to fit this situation.

More introduction. The students of this age don't seem to remember what was discussed at the beginning of my unit so they could relate easily.

I would follow the first activity, Thumbs Up Thumbs Down, with a discussion and composition of new statements before I went on to the Electrical Eight activity.

Question 3

Larger allotments would be made for commercial fishing boats.

Questions 5 and 9

Very few families in this area of Minnesota have air conditioning and since many students choose to go to summer school this question didn't have the effect it could have had.

Question 8
What other choice would they have? School is compulsory at this age.

Best question was No. 7, except some students at this level still can't understand that if enough people refuse to buy a product, the product would have to change. The attitude seems to be--"I can't do it alone, so why do anything?"

More questions in the "Thumbs Up Thumbs Down" voting activity. Make questions more appropriate to specific age levels (e.g., junior high, senior high, etc.).

Include resources for area where unit is being taught.

A response to questions 1-9 on paper rather than thumbs up, thumbs down technique. Some were swayed to change their opinion by looking at peer's opinions.

May I suggest that you change your questions on the student evaluation. Aren't you more interested in:

1. Did this unit cause you to change your behavior in any way, e.g., turn off lights?
2. Are you now concerned about the energy crisis?
3. Did the unit excite you?
4. Did you do any follow-up study on your own after the unit? (For instance, some of my students called others for more information.)

The question: "Was the unit worthwhile to you?" is too vague. The students tend to think that because they didn't accumulate "fact and info" they didn't accomplish enough.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

- Establish in the introduction the basic concept of an energy crisis. Some of my students were thinking basically only in terms of electricity rather than fuel, etc.

Use the slide set and resource person.

Resource persons of energy used in home, personal and community, i.e., Northern States Power, transportation system; persons from nature centers about pollution from snowmobiles, etc., to ground animals, chemical fertilizers, insecticides; FDA about additives to foods in relation to health, recycling items.

Perhaps not limit to just senior students.

I would like to have followed up the values clarification questions - the students need a few more "facts" before they can make valid decisions. (I'm not necessarily a fact-orientated teacher, but they are needed to make decisions). The students were skeptical than an energy crisis exists.

It needs to be taught in a quiet area and I would recommend using class broken into groups of 4-6 to do discussion topics so that all can be involved in discussion.

Slide set has too much advertising for Natural Gas, especially in the last half. If natural gas is better than other sources of energy, it would be more convincing to obtain this information from a source other than Natural Gas Company. The first half of the slide is valuable, however.

After listing all electrical equipment we could think of, we had students get into small groups and list them according to use for 1) need, 2) comfort, 3) convenience, 4) pleasure. Their concept of need was extremely interesting. We discussed their listing and also had students think of nonelectrical substitutes for the "needed" items.

Have a Thumbs Up Thumbs Down activity response sheet made up for each student to keep track of responses. Then they can be used to stimulate the discussion following.

Involve resource people.

A debate panel or pros and cons of energy crisis - how we can help.

Bring in someone from the power company and maybe an electrician to discuss possible measures people could take to reduce electrical consumption.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> My students were very enthusiastic when they became involved with the units. They had fantastic discussions in which they raised many valid questions and concerns. I would suggest a further study of the aluminum cans vs. glass bottling values clarification question. (We had a very exciting, lengthy discussion on this question--the students could really relate to it.) They had somewhat more difficulty relating to the questions on a vacation, commercial fishing, air-conditioning, as they had never personally experienced the situations. (But I still felt these were good questions as it made them more aware of uses of energy outside "their own world.")
>
> Many students are very negative about giving up luxuries or modifying their behavior in light of an energy crisis. More could be added to this unit to try to help them view their behavior in the light of necessary change.
>
> Excellent idea to implement nursery schools through high school, vocational/technical schools and colleges.
>
> Electric Eight:
> Maybe because of age, students didn't seem to be able to attach values to their decisions. Too many 7th graders (also 8th and 9th, I believe) are far removed from the running of a household so have no idea of whether or not items such as water heater, water softener, furnace starter, water pump, freezers are needed or why?
>
> There needs to be more information given at an earlier age (not just information either - our whole society is so geared to the idea of "bigger and better and more" that there has to be changes made all around. Schools alone can't do it, but projects such as these started at the earliest age possible (on their level) and continued on up can help.
>
> Good luck - I think this is a worthwhile endeavor.
>
> The units were not sent out early enough for one to make adequate plans to work this into our units!
>
> I found your time limitations too restrictive: This activity took us four days - the students thought it was a good exercise and made them more aware of how much electricity we use.

Student Feedback	Number	Percent
Number of students responding	38	100%
Number and percent of students who thought this Unit was worthwhile.	32	84%
Number and percent who would recommend this Unit to friends.	24	65%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	44	80%
No, I did not like it	5	9%
Don't know	6	11%

Students were asked for some reaons why they liked or disliked this Unit. Some selected comments are listed here:

Boring.

We didn't accomplish anything.

Makes a person think.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	15	40%
No	14	38%
Don't know	8	22%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Make questions more exciting and lively.
More facts.
Make questions more appropriate for seniors.
OS. No change.
Don't play the game.
More discussion.

The Unit: ORIENTEERING

Use of resource people and places in the 3 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	1	33%
Community	0'	0
Natural Resource	0	0
Other	0	0
I didn't use any	2	67
Places		
School site	1	33
Community	0	0
Regional	0	0
Other	1	33

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	3	100%	0	0%
The Goal statements were clear	3	100	0	0
The Activity Description was adequate	3	100	0	0
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	2	100	0	0
The Evaluation Part was useful	2	100	0	0

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	2	67%	1	33%
I would teach this Unit again	2	100	0	0
I think this Unit depends on the use of sites	3	100	0	0
I think this Unit depends on the use of resource people	1	33	2	67
Goal statements were appropriate for grade/age level	2	100	0	0
Activities in the Unit were effective in helping students attain stated goals	2	100	0	0
Experience with this Unit has caused me to (or will) modify other courses I teach	3	100	0	0
Cost and availability of materials necessary to teach this Unit have been a problem	1	33	2	67
Most of my students were enthusiastic about the Unit	1	50	1	50
The Unit was easy to relate to the subject area I taught it in	2	100	0	0
The Unit is a valid environmental educational activity	3	100	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	3	100%

The following are some of the additional materials that were used in the trial testing of this Unit:

Filmstrips.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

More preparation.

Fall or spring setting.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Check the area of state to be used in and the availability of material.

Location must have some true outdoor aesthetic values.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> Will do it again.
>
> Check the area of state to be used in and the availability of materials.
>
> I could not find the place to carry out the assigned project. Leave the choice up to the teacher as to which area he or she will use.
>
> I felt the project would have lost much of its effect without a fairly wooded wildlife area. Felt it should have been an area the students were not familiar with and we could not get to one due to the school schedule.

Student Feedback	Number	Percent
Number of students responding	6	100%
Number and percent of students who thought this Unit was worthwhile.	4	67%
Number and percent who would recommend this Unit to friends.	4	67%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	4	67%
No, I did not like it	1	17%
Don't know	1	16%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Mixed feelings.

Very worthwhile.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	5	83%
No	0	0
Don't know	1	17

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Should have broader scope and depth.

Have natural habitat set up.

Get the school board in on it.

Bring students outside.

The Unit: WHAT IS IT?

Use of resource people and places in the 2 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	0	0
Natural Resource	0	0
Other	0	0
I didn't use any	2	100
Places		
School site	1	50%
Community	0	0
Regional	1	50
Other	0	0

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	2	100%	0	0%
The Goal statements were clear	2	100	0	0
The Activity Description was adequate	2	100	0	0
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	2	100	0	0
The Evaluation Part was useful	2	100	0	0

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	2	100%	0	0%
I would teach this Unit again	2	100	0	0
I think this Unit depends on the use of sites	0	0	2	100
I think this Unit depends on the use of resource people	0	0	2	100
Goal statements were appropriate for grade/age level	1	100	0	0
Activities in the Unit were effective in helping students attain stated goals	2	100	0	0
Experience with this Unit has caused me to (or will) modify other courses I teach	0	0	2	100
Cost and availability of materials necessary to teach this Unit have been a problem	0	0	1	100
Most of my students were enthusiastic about the Unit	1	100	0	0
The Unit was easy to relate to the subject area I taught it in	0	0	2	100
The Unit is a valid environmental educational activity	2	100	0	0

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	2	100%

The following are some of the additional materials that were used in the trial testing of this Unit:

Keys of mammals, birds, plants; Peterson series of Identification books.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

To have full support it should be tried in an EE class.

The unit would be much improved if offered in a biology unit where the biology room could be used (stuffed specimens, etc.).

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Go out in the community and find your animals or birds.

Use the unit in the fall or spring so outdoor site, for some portion of the unit, may be utilized.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

None.

Student Feedback	Number	Percent
Number of students responding	9	100%
Number and percent of students who thought this Unit was worthwhile	6	67%
Number and percent who would recommend this Unit to friends	6	67%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	6	75%
No, I did not like it	1	13%
Don't know	1	12%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

OK

Boring

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	1	14%
No	1	14%
Don't know	5	72%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Give examples of what we're to do.

We should go outside.

The Unit: NEW THINGS

Use of resource people and places in the 4 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	0	0%
Natural Resource	0	0%
Other	1	25%
I didn't use any	4	100%
Places		
School site	3	75%
Community	2	50%
Regional	0	0%
Other	1	25%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	4	100%	0	0%
The Goal statements were clear	4	100%	0	0%
The Activity Description was adequate	4	100%	0	0%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	2	100%	0	0%
The Evaluation Part was useful	2	67%	1	33%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	2	50%	2	50%
I would teach this Unit again	2	50%	2	50%
I think this Unit depends on the use of sites	4	100%	0	0%
I think this Unit depends on the use of resource people	1	25%	3	75%
Goal statements were appropriate for grade/age level	4	100%	0	0%
Activities in the Unit were effective in helping students attain stated goals	3	75%	1	25%
Experience with this Unit has caused me to (or will) modify other courses I teach	1	25%	3	75%
Cost and availability of materials necessary to teach this Unit have been a problem	0	0%	4	100%
Most of my students were enthusiastic about the Unit	3	75%	1	25%
The Unit was easy to relate to the subject area I taught it in	3	25%	1	25%
The Unit is a valid environmental educational activity	2	67%	1	33%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	0	0%

The following are some of the additional materials that were used in the trial testing of this Unit:

None.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

> Perhaps I would teach this unit to younger students than 10th graders. The older students weren't as serious about "smelling twigs" as would my junior high students. Also, I think a lead-up to overall awareness would get students off on the right start.
>
> More time and explanation of unit.
>
> Change - I would rather know more about a person-made than a natural environment because:
>
> To - which one you would rather know more about.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Have a large land area available to walk through, with as many varied land environment (i.e., housing, fields, construction sites, lakeside, etc.) as possible.

Set up a unit on camping and back packing.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> Feel unit on basic senses (hearing, touch, etc.) should proceed this activity.
>
> I received the materials too late. There were only 6 class periods before the due date.
>
> The success of this unit depends on your land location. The more varied the environment the better. Allow enough time to elapse for students to comb a wide area. Also, it's best to do this activity in warm weather--interest and enthusiasm will be better. Of the two units I taught, this one was easier for me to present, but enjoyed less by my students than the other.

Student Feedback	Number	Percent
Number of students responding	14	100%
Number and percent of students who thought this Unit was worthwhile	4	29%
Number and percent who would recommend this Unit to friends	6	43%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	7	58%
No, I did not like it	1	9%
Don't know	4	33%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Fun.

Learned how much you miss out on.

Interesting.

Didn't get anything out of it.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	7	58%
No	5	42%
Don't know	0	0%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Pick an area where you get a bigger choice of things.

Make questions more understandable.

Could be in the summer.

Make it more worthwhile.

The Unit: STUDENT INTEREST

Use of resource people and places in the 5 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	0	0%
Natural Resource	0	0%
Other	1	20%
I didn't use any	5	100%
Places		
School site	3	60%
Community	1	20%
Regional	0	0%
Other	2	40%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	4	80%	1	20%
The Goal statements were clear	5	100%	0	0%
The Activity Description was adequate	3	60%	2	40%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	1	100%	0	0%
The Evaluation Part was useful	3	60%	2	40%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	1	20%	4	80%
I would teach this Unit again	4	80%	1	20%
I think this Unit depends on the use of sites	2	40%	3	60%
I think this Unit depends on the use of resource people	1	20%	4	80%
Goal statements were appropriate for grade/age level	5	100%	0	0%
Activities in the Unit were effective in helping students attain stated goals	4	80%	1	20%
Experience with this Unit has caused me to (or will) modify other courses I teach	1	20%	4	80%
Cost and availability of materials necessary to teach this Unit have been a problem	0	0%	5	100%
Most of my students were enthusiastic about the Unit	2	40%	3	60%
The Unit was easy to relate to the subject area I taught it in	4	80%	1	20%
The Unit is a valid environmental educational activity	3	60%	2	40%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	0	0%

The following are some of the additional materials that were used in the trial testing of this Unit:

Camping equipment.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

Why do things inside. Make use of the outdoors.

Perhaps to drop the part where students are trying to persuade each other into enjoying a certain activity. This could be done in a large group and could cut the time factor.

Our students are mostly rural farm kids and not much of it was a new experience for them.

Lists of 10 likes and dislikes questionable.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> I didn't find that any of this was necessary because it merely dealt with the things the students had experienced in nature.
>
> Do this unit during the change of season, i.e., fall to winter. There was a drastic interest change in my class when the snow came. Allow a minimum of 2 hours for this activity. If you hurry, the responses aren't honest and students become frustrated and their effort decreases.
>
> It helps if you teach a unit on camping and hiking and are able to take the students on various trips.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> We should have received these materials sooner. I was too rushed. I was disappointed that we were not involved in outdoor activities. My class responded to this well, but time allotment hindered us from doing a real adequate job.
>
> I think this unit would work very well in my unit dealing with personality and interest. In fact I would like to try it again there next term. Because it was used at a period between two units, I don't feel the students were as enthusiastic as they could have been. However, I do feel this unit takes a great deal of time, especially since to be of any value it must be repeated. In view of my limited time schedule, it was hard to fit both times in.
>
> I do feel that more preparation for the teacher in this area of environmental education is needed. My background and understanding is quite limited and this made my presentation of these units more difficult.

Student Feedback	Number	Percent
Number of students responding	10	100%
Number and percent of students who thought this Unit was worthwhile	8	80%
Number and percent who would recommend this Unit to friends	8	80%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	7	70%
No, I did not like it	2	20%
Don't know	1	10%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Something different.

Kind of funny.

Opens up things you never thought of.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	6	67%
No	3	33%
Don't know	0	0%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

OK.

The Unit: RECREATION VEHICLES

Use of resource people and places in the 12 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	3	25%
Community	0	0%
Natural Resource	1	8%
Other	1	8%
I didn't use any	7	58%
Places		
School site	11	92%
Community	0	0%
Regional	0	0%
Other	1	8%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	10	83%	2	17%
The Goal statements were clear	12	100%	0	0%
The Activity Description was adequate	8	67%	4	33%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	5	100%	0	0%
The Evaluation Part was useful	9	82%	2	18%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	4	33%	8	67%
I would teach this Unit again	8	73%	3	27%
I think this Unit depends on the use of sites	5	42%	7	58%
I think this Unit depends on the use of resource people	7	58%	5	42%
Goal statements were appropriate for grade/age level	11	92%	1	8%
Activities in the Unit were effective in helping students attain stated goals	10	83%	2	17%
Experience with this Unit has caused me to (or will) modify other courses I teach	2	17%	10	83%
Cost and availability of materials necessary to teach this Unit have been a problem	0	0%	12	100%
Most of my students were enthusiastic about the Unit	9	75%	3	25%
The Unit was easy to relate to the subject area I taught it in	9	75%	3	25%
The Unit is a valid environmental educational activity	12	100%	0	0%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	1	8%

The following are some of the additional materials that were used in the trial testing of this Unit:

Library - Snowmobile.

Film on XC skiing.

Filmstrip - camping, conservation.

The following is a listing of some of the changes recommended by teachers, before this Unit be taught again:

At two days of preparation for the unit by bringing in outside resource people.

More information about what you want done.

We did this in 4 class periods and I felt we did not have enough time.

Include much material both pro and con on the issues involved.

More time.

Stronger background of facts and figures to support conclusions.

I might like to take students to visit a recreational vehicle builder and possibly have in someone from DNR to discuss plus and minus of machines.

Implement it in an area other than phy. ed.

Give to instructor who knows more about city council.

It was a better unit than I had thought it would be. The students responded well and made it a success.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

1. Bring in resource people.
2. Assign students to be for or against according to their role.
3. Have mayor read evaluation remarks and give opinions.

Use resource people so students would use statistics, etc., as well as their emotions. Time would allow students to do this digging for info.

I had the students write comments after the vote was taken, - On their feelings about the unit.

Explain fully the procedure to both sides before starting.

Lots of research - perhaps each student could be assigned an interview with the person he will represent in the assignment.

Use resource people of community.

I might like to take students to visit a recreational vehicle builder and possibly have in someone from DNR to discuss plus and minus of machines.

Talk to some resource people.

Hope the students are more willing to talk without yourself having to keep it going.

Look into subject very much and know all about the unit.

The people taking the roles should be selected carefully--volunteers may work in some classes.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> The unit was well prepared. It made students look at both sides of the issue. It also made them aware of the many areas of life that is affected by such an issue.
>
> This unit really made tempers flare. The students really enjoyed it, because of above and previous comments, I feel it may have been even better.
>
> Interesting unit. Would like to do more along this line.
>
> Just didn't have time. One hour a day.
>
> Is workable and could be meaningful units.
>
> The class seemed to enjoy the unit very much.
>
> The majority of the class participated.
>
> People with a better knowledge of environmental education should teach this unit.
>
> It was a difficult unit to teach. The girls were not very willing to discuss the topics--they had no interest. Older girls could make the difference.
>
> My class meets once in 6 days so each class period is one activity, so they didn't have a chance to prepare as they should have. But it was good discussion and could have been better with more preparation.
>
> The kids in my class are so snowmobile oriented and know so little about ecology and environmental protection that it would require at least a week of education before this could be anything other than the lopsided discussion in favor of the project which it turned out to be.
>
> Another time I will make a lot more advance prep. I was wrong in assuming that the students would be pretty well informed. They knew only about the fun of snowmobiling.
>
> I would have preferred the other elected unit "Orienteering--With a Difference," but the snow makes an orienteering unit too easy for the cheaters. I plan to use that one in the spring.

Student Feedback	Number	Percent
Number of students responding	35	100%
Number and percent of students who thought this Unit was worthwhile	29	83%
Number and percent who would recommend this Unit to friends	24	69%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	26	74%
No, I did not like it	2	6%
Don't know	7	20%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Fun and interesting.

I didn't understand it that well.

We all got our say in what we believed in.

Pointed out pros and cons of vehicles.

OK but didn't learn that much.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	11	32%
No	19	54%
Don't know	5	14%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Set everybody to participate.

More information.

More time.

The Unit: WILDERNESS

Use of resource people and places in the 7 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	1	14%
Community	1	14%
Natural Resource	0	0%
Other	0	0%
I didn't use any	5	71%
Places		
School site	7	100%
Community	0	0%
Regional	0	0%
Other	1	14%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	6	86%	1	14%
The Goal statements were clear	5	71%	2	29%
The Activity Description was adequate	6	86%	1	14%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	4	100%	0	0%
The Evaluation Part was useful	6	86%	1	14%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	1	14%	6	86%
I would teach this Unit again	6	86%	1	14%
I think this Unit depends on the use of sites	3	43%	4	57%
I think this Unit depends on the use of resource people	3	43%	4	57%
Goal statements were appropriate for grade/age level	6	86%	1	14%
Activities in the Unit were effective in helping students attain stated goals	5	71%	2	29%
Experience with this Unit has caused me to (or will) modify other courses I teach	3	43%	4	57%
Cost and availability of materials necessary to teach this Unit have been a problem	1	14%	6	86%
Most of my students were enthusiastic about the Unit	6	86%	1	14%
The Unit was easy to relate to the subject area I taught it in	6	86%	1	14%
The Unit is a valid environmental educational activity	6	86%	1	14%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	1	14%

The following are some of the additional materials that were used in the trial testing of this Unit:

None. My personal experience in the wildness was very helpful.

Just my equipment and food lists.

No materials used.

Canoeing, camping pamphlets on sites and what they have to offer.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

The students really related to this unit as 80% of them had been on a camping trip to the B.W.C.A. and they were enthused.

I would recommend the use of more information about the B.W.C.A. (maps, outfitters, literature, etc.). Many of my students were completely unaware of the B.W.C.A. when we started the unit.

Utilize more time for students to investigate B.W.C.A. and canoe outfitting procedures and costs, and general outdoor information.

Clearer goal statements.

None. Enjoyed teaching it.

What is the time limit for spending this $25,000. Is it a week, month, year, etc. Will I get more money in the future to continue or am I on my own in the future. Students and myself were both confused as to time limits on the money.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

1. A field trip to a wilderness area at the start of the unit would be helpful.
2. A canoe outfitter as a resource person would be applicable.

Using this unit during either fall or spring quarter along with my canoeing unit might have made it even better.

It could also be adapted to a unit on Minnesota history, perhaps using the book The Voyageurs Highway, by Nute.

Make the cabins of standard size w/furnishings, etc. Make the facility consistent for all students. Use resource people on: (1) BWCA, (2) canoe outfitting, early in unit.

Equipment and a closely facility.

Transportation.

Use resource people and take considerable time in defining the word sensitivity!

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> It was well put together and created enthusiastic interest!
>
> List more statements, ideas, group discussion ideas, etc., to get more open communication in class.
>
> Also, give instructor information on basics of the unit taught and a bibliography for unit. Any A-V materials available also should be listed.
>
> This was good unit. Enjoyed teaching it and the students responded well.
>
> I don't think my comments in this section would be valid because of the late start I got. I was unable to utilize outside materials. However, I feel these units were valuable and also included excellent tasks to achieve the stated goals.
>
> One comment I could make is that we had trouble finding material to help with the recreational vehicles unit.
>
> I feel units such as these would be valuable and useful if they were taught by resource people and in a short unit and not spread over a longer period of time. Just throwing it in the middle of your other plans does not tie the ends together and makes for confusion and what are we doing this for attitude.

Student Feedback	Number	Percent
Number of students responding	20	100%
Number and percent of students who thought this Unit was worthwhile	16	80%
Number and percent who would recommend this Unit to friends	14	70%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	17	85%
No, I did not like it	2	10%
Don't know	1	5%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

A waste of time.

It was interesting.

Makes you stop and think.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	8	40%
No	8	40%
Don't know	4	20%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Create more interest.

Needed more information.

Out-of-doors type of project.

More time for discussion.

The Unit: MYSTERY WALK

Use of resource people and places in the 12 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	4	31%
Community	2	8%
Natural Resource	0	0%
Other	1	8%
I didn't use any	6	46%
Places		
School site	6	46%
Community	6	46%
Regional	2	15%
Other	0	0%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	12	100%	0	0%
The Goal statements were clear	11	92%	1	8%
The Activity Description was adequate	10	83%	2	17%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	2	100%	2	0%
The Evaluation Part was useful	8	73%	3	27%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	2	17%	10	83%
I would teach this Unit again	10	83%	2	17%
I think this Unit depends on the use of sites	10	83%	2	17%
I think this Unit depends on the use of resource people	2	17%	10	83%
Goal statements were appropriate for grade/age level	11	92%	1	8%
Activities in the Unit were effective in helping students attain stated goals	11	92%	1	8%
Experience with this Unit has caused me to (or will) modify other courses I teach	3	25%	9	75%
Cost and availability of materials necessary to teach this Unit have been a problem	7	58%	5	42%
Most of my students were enthusiastic about the Unit	12	100%	0	0%
The Unit was easy to relate to the subject area I taught it in	10	83%	2	17%
The Unit is a valid environmental educational activity	11	92%	1	8%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	3	25%

The following are some of the additional materials that were used in the trial testing of this Unit:

We used regular cameras.

Darkroom and equipment.

City maps.

Waste sack.

Paper bags for litter.

Would use black and white film to cut expense.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

Better means of evaluation for 2nd part. Reconstruction of walk. Kids will be kids and you have to have some assurance they will not just "goof off."

More economical method of getting pictures.

Organization of camera equipment and method of taking pictures. Too many were impossible to identify. Too much sky in picture. Not specific enough.

Students commented that the unit would be more effective in the spring or fall rather than in December. I thought that the unit was very good.

We had so much trouble with the cameras.

Make parts with a few more questions.

We had difficulty with the cameras and just wonder if an instamatic would have been better to use. No mess, fuss, and most pictures probably would be clearer.

Lower grade levels for all material I had.

Use black and white film. We could develop this ourselves to cut cost. Polaroid too expensive for class of 300.

Most useful to those who have a large natural school site available.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> I had students plant color coded stakes at steps 6 and 12 or halfway and at end. These were to be recovered by other group to show they could follow the route.
>
> Students could coordinate this unit with a unit in photography.
>
> 1. Small groups.
>
> 2. Use only Polaroid camera to get desired picture!
>
> I used an audio-visual man to show students how to use the cameras. A waste sack should be taken with the group as they take the pictures.
>
> The unit should be taught in the fall when the temperature is warm enough for Polaroid film to develop/or spring.
>
> I had two groups go without a camera and just write on paper a detailed walk. This was easier to follow than the one with the pictures.
>
> In science it would be extremely useful to use the unit in the beginning of the year. The idea of getting out--becoming more aware--is the first step and believe the teaching life easier. I think it would be a good idea.
>
> Take paper bags to throw waste products of polaroid film in so don't litter area.
>
> We had to use two class periods. One to take pictures, one to go out and follow trails, so could have easily used cheaper film and developed it between times.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> Time of year was, of course, not ideal, but students enjoyed it. They had an easier time following the trails than I thought they would.
>
> Our students are used to group activities, so we had no problems with the groups. If the students had no previous experience walking in groups you might have problems.
>
> Our study was carried out in the winter, making Polaroid cameras useless--we used ordinary 126 black and white with 12 exposures. Bus and film and development could be a problem, but if the community were used, cost would be less.
>
> Art teacher expressed a real interest in this and plans on using it for spring classes. Seemed appropriate for art, more appropriate apparently than the EE unit received especially for art.
>
> I thought that theunit was effective, however, there are some problems: Cost, availability of people to go with students.
>
> I don't think my administrators would allow me to spend in excess of $100 for film for all the sections that I teach. They also request that all groups are under supervision, which makes it hard to do a unit like this.
>
> Environmental education, in general, is too "social studies" oriented and is not involved with biological science enough. The latter can be interesting to all, if presented concisely and not made too easy. Most actual environmental lessons that are scientific are far too easy and, thus, boring to interested students.
>
> One thing of some humor. One group notices a rabbit along their trail and wrote it in the directions, "Now notice a rabbit just off to the left." Three days later when another group was following the trail of the first group, they came to the part about the rabbit on the left, looked up and the rabbit scampered off.

Student Feedback	Number	Percent
Number of students responding	40	100%
Number and percent of students who thought this Unit was worthwhile	36	90%
Number and percent who would recommend this Unit to friends	30	75%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	73	86%
No, I did not like it	8	9%
Don't know	4	5%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Fun and challenging.

Not boring like regular class time.

Too childish for high school students.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	29	34%
No	42	49%
Don't know	14	17%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

OK the way it is.

More time.

Make it more challenging.

The Unit: HOW DO YOU FEEL?

Use of resource people and places in the 27 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	9	33%
Community	14	52%
Natural Resource	0	0%
Other	3	11%
I didn't use any	11	.41%
Places		
School site	15	56%
Community	20	74%
Regional	2	7%
Other	2	7%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	21	78%	6	22%
The Goal statements were clear	24	89%	3	11%
The Activity Description was adequate	21	78%	6	22%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	12	80%	3	20%
The Evaluation Part was useful	22	82%	5	18%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	11	41%	16	59%
I would teach this Unit again	22	86%	5	14%
I think this Unit depends on the use of sites	8	30%	19	70%
I think this Unit depends on the use of resource people	10	37%	17	63%
Goal statements were appropriate for grade/age level	24	89%	3	11%
Activities in the Unit were effective in helping students attain stated goals	22	86%	5	14%
Experience with this Unit has caused me to (or will) modify other courses I teach	8	30%	19	70%
Cost and availability of materials necessary to teach this Unit have been a problem	0	0%	27	100%
Most of my students were enthusiastic about the Unit	18	67%	9	33%
The Unit was easy to relate to the subject area I taught it in	23	88%	3	12%
The Unit is a valid environmental educational activity	24	92%	2	8%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	6	23%

The following are some of the additional materials that were used in the trial testing of this Unit:

I used only the material mentioned in the unit.

None except for Minnesota Volunteers as a reference book.

Survey form which was developed by the class.

Paraprofessional help, paper, mimeograph stencils, survey forms, summary forms.

A-V materials of environmental problems.

Outdoor sites.
Field Trips.
Films.
Filmstrips.
Many references - books, magazines, etc.
Library.

Filmstrips and tapes from Warren Schloat, National Geographic, and New York Times.

Books and periodicals (list I made with the help of our librarian is attached.)

The use of field trips - going directly to the site.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

> I will use this again in a situation where it would be a spontaneous reaction to take a poll. In the case where a student asks the question "How many people do you think really believe that?"
>
> The unit itself was good. It has to be used in the "right" class.
>
> Better definitions of terms in introduction. The part of the exercise where students form their own hypothesis was a waste of time.
>
> Change the activity description. Why have the question first and then make up a questionnaire. To me, a description of why you do each should be better explained.
>
> None, it went quite well and the students learned from it.
>
> I intend to do this one again very soon and I would like to collect a prediction or hypothesis sheet from each, summarize this as a class after the survey. Doing so before doing the survey might be a good idea but I wonder if students may be a little more selective in whom they survey rather than a random selection.
>
> Give more suggestions as to goals.
>
> Questions for survey could be simplified.
>
> I would avoid the survey or questionnaire part and would only employ it if completely initiated by the students. I would make use of role-playing and group debates or discussions.
>
> The survey questions could possibly be more interesting. Adults would likely be apathetic or impolite to student survey personnel.
>
> A complete sample questionnaire should be included as an example for the students to study before they construct their own, since this is the first time that all or most of them have done a survey.
>
> A more detailed introduction. A longer time to prepare for it and to fit into our curriculum. (Material should be handed out earlier in the school year.)
>
> I would not use it again.
>
> I think I would reduce the questionnaire to maybe 6-8 questions and then give more time to determining what the results say. Compiling the data charts got to be a pretty tedious task.

The use of a questionnaire in an area like ours (rural) was not good. The students had a hard time rounding up enough people to fill in the questionnaire. Face to face contact, in a community would be good.

Would make it easier to do the unit in a shorter time if students were more familiar with the terms.

No comment!!

I think it sets up pretty well.

The unit needs to have a purpose--just making up questions for a survey doesn't work very well. They have to see a real need for the questions, or they won't be very enthusiastic.

I would recommend the use of resource people and outside materials.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Spend time on defining questions.

You need no special equipment. Discuss various environmental topics before starting the actual unit. Enough interest has to be generated so students take the unit more seriously.

Use less time setting up hypothesis and spend more time on developing good questionnaires. Be sure questionnaires are objective.

Check with other schools and/or teachers ahead of time if they would be willing to have your students come to conduct the survey in their schools, and when to come.

Some students in your class who know how to type should be asked to type the final copy for the dittoed questionnaires, if they fail to volunteer to do so.

Emphasize careful selection and structure of poll questions, i.e., people will not answer questions that require long answers.

Limit areas in survey. We had too many different areas which were hard to keep track of. Ex., male vs. female; landowner vs. non-landowner, and over 30 and under 30.

This unit would work, but it has to be used when a question arises that can be answered with a survey, not in a contrived situation.

The use of field trips - going directly to the site.

Have students define several areas to survey, then eliminate all except one that will provide good results.

Our class had several ideas they wished to survey. If we do more of them soon (which I believe we will) I will recommend they do not ask the same individual's that were contacted in the first or previous surveys.

Explain thoroughly the importance of polls.

Give students a gripe session to see what they have strong feelings about, then have them guess if others would agree.

Get started earlier than we did.

I would avoid the survey or questionnaire part and would only employ it if completely initiated by the students. I would make use of role-playing and group debates or discussions.

Our school district has not seen fit to spend any monies or effort towards having a natural area. Resource people are few and far between.

This unit should first be given to a teacher in the higher levels. 11th and 12th grade students showed much interest when I showed much interest when I showed it to them. (I do not have them in any of my classes.)

When students write up the survey, make very sure their questions are clear and understandable to those who will be answering it for them. Also hold down the number of questions to about 6 or 7.

1. Make sure questions and questionnaires are OK'd by the administration.
2. Prompt distribution and collection are essential.
3. Give each of the students some responsibility and let the "class" do it as much as possible.

Class should be taught background information first. For example, we did questionnaire on recycling glass and we were not adequately informed about our town's glass recycling program.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

Good unit!

Many ideas about the environment were raised not only by the questions, but by the discussion about the questions. The hardest part of the unit was analyzing the data. It seemed tedious for many students to tabulate the results, but I think they did become aware of the work involved in the questionnaire. On a survey of most students, they liked it, would recommend this questionnaire to be used again.

Seventh graders did get quite enthused over the unit. Best part of the unit was where students analyzed the charts made from data they collected.

It was a tough one to get started but once started it worked nicely. The slowest of my classes had a tougher time grasping why we did a question and then a questionnaire. The smartest group caught on faster and enjoyed it more.

This is a relatively good unit. It was adaptable to tenth grade level. I think it could be used in other courses besides biology. I think it could be used for any senior high grade level.

I particularly like this one because it is very flexible, topics are of what concerns the student now, and it does not require any special equipment or materials that schools do not already have. Also, it can easily be adjusted to a level of sophistication to the individual performing the survey. I see no reason why this unit cannot be adapted to any of our disciplines presently in our school without any unnecessary repetition.

I must confess to having mislaid this material, so the unit was started late.

We did not have time for an elected unit but did make an attempt to use the survey.

I also happen to have an apathetic class this semester.

My answers should not be taken too seriously.

The units look excellent to me.

Thank you for your work in this area and please continue. We need this (environmental education) sort of thing desperately!!

This is OK for other subject areas. Biology has environmental education built into the course. I would suggest that a second biology course possibly be added (i.e., ecology) or use BSCS green version.

I used an entire month for this unit and one other. I set up a contract system whereby students could earn A, B, or C grades. We did the unit as set up, but students were also required to read books, periodicals, make oral reports and set up a bulletin board.

I felt it was necessary to implement the unit, otherwise it had no real value.

I feel a survey of any kind should be a senior high activity. I am in no way prepared to ask questions that will not be suggestive of an answer. The national opinion polls require hours of research - I have neither the time nor the training. Perhaps this would be more appropriate in a social studies area where political poll training would help in this survey area.

I think teachers should know that it will probably take a total of 5 days to teach the unit well. It would be better to plan for more time and complete the unit sooner than to feel pressed for time. I thought I could do it in 3 but needed 4½ class periods.

It seemed to take more time than I had hoped that it would. I believe that we spent 3 hours working on it.

We did a random sampling of community people on environmental issues then did a follow-up of the entire populus to see how accurate a random sample is.

I think the units can be implemented without any problem in all phases of secondary education - I really enjoyed using the elementary mini-unit set in the secondary, as I felt there was much information and many activities secondary students could benefit from. I think both are excellent!

We had no meeting to discuss or introduce the material.

I got the material, by mail, November 5, not October 1. With more time, and time to plan and to do, they probably would have been good units.

I would recommend this for junior high school, and possibly 10th grade, but no juniors and seniors.

It also seemed to take too long to complete. The students seemed to loose interest, and there wasn't enough for everybody to do.

I wish we had funds to run a field trip to view first-hand the environmental impact areas we covered in our survey.

The survey did point out differences between female and male thinking and between town and rural dwellers.

If you will stop and think about it, I think you will realize that a class of 30 perhaps could do a survey, but how do you propose to set up a survey with 130 plus students. There is no way that I know of to turn 130 students loose on the town and get anything accomplished. I ended up having each student poll the members of his or her family -this at least is a possible method of attaining your survey goals.

1. This unit was excellent! It gave the students an opportunity to go out into their community to discover the opinions that other students and adults have about questions of importance.

2. It caused the students to think about important environmental problems and to formulate questions about them.

3. It gave the students a practical opportunity to plan and discuss in small groups, a problem of their choice.

4. It provided an opportunity for the class to learn through experience how to conduct a survey.

5. It provided a spring board for student action and community cooperation concerning environmental problems.

Student Feedback	Number	Percent
Number of students responding	85	100%
Number and percent of students who thought this Unit was worthwhile.	71	84%
Number and percent wh would recommend this Unit to friends.	58	68%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	73	86%
No, I did not like it	8	9%
Don't know	4	5%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

It was worthwhile.

Gave me other opinions.

It was fun.

Broadened my views on national & local environmental issues.

Didn't teach us anything we didn't know.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	29	34%
No	42	49%
Don't know	14	17%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

More survey sheets.

More time.

Topic could have been made more interesting.

Too much research & not enough doing.

Questions are too general.

The Unit: PHOSPHORUS LEAKS

Use of resource people and places in the 13 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	4	41%
Community	3	23%
Natural Resource	1	8%
Other	1	8%
I didn't use any	5	39%
Places		
School site	8	62%
Community	9	69%
Regional	4	81%
Other	0	0%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	9	82%	2	18%
The Goal statements were clear	6	55%	5	15%
The Activity Description was adequate	12	100%	0	0%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	7	100%	0	0%
The Evaluation Part was useful	10	83%	2	17%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	5	42%	7	85%
I would teach this Unit again	10	83%	2	17%
I think this Unit depends on the use of sites	7	58%	5	42%
I think this Unit depends on the use of resource people	6	50%	6	50%
Goal statements were appropriate for grade/age level	9	75%	3	25%
Activities in the Unit were effective in helping students attain stated goals	10	83%	2	17%
Experience with this Unit has caused me to (or will) modify other courses I teach	4	33%	8	67%
Cost and availability of materials necessary to teach this Unit have been a problem	3	25%	9	75%
Most of my students were enthusiastic about the Unit	9	82%	2	18%
The Unit was easy to relate to the subject area I taught it in	9	75%	3	25%
The Unit is a valid environmental educational activity	12	100%	0	0%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	9	69%

The following are some of the additional materials that were used in the trial testing of this Unit:

1. Had shown filmstrip "Understanding Lakes and Lake Problems" by U. Wisc. Ext. Service - ex. slide series.

2. Also showed "The Ecology of Polluted H2O" by NASCO, Fort Atkinson, Wisc.

3. Several excellent films on H2O Quality.

Hach-Lamotte H2O testing kits.
Pamphlets relating to lake standards, zoning, aquatic pollutants, previous student studies of aquatic env. re pollutants. pop. Data from Fed. Water Qual. Lab - Duluth.

I took and used a test set for plant fertilizers to show phosphate presence.

Modern Biological Principles, Winchester sections covering ATP energy storage and use in living organisms.

Hennepin County Library - Ecology Packets

Map made by students of the area, to see if there was some correlation with phosphorus % and area where samples were taken.

Citations from articles pertinent to materials.

When taking water samples, students will need hip boots or waders. Also, inform them to take at least 3 samples in each location, trying to avoid contamination.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

1. Give a little more background information for teachers such as on agencies, etc., concerned with water quality. Maybe names of resource persons available in any community.

2. Realizing teacher resourcefulness and ingenuity are important. It might help some if listing of information of field trip sites were given.

This unit should include cther conditions of water besides phosphorus contamination.

Suggest community water sites for chem. testing (field) Ph levels. Data sheets format suggested for comparison of levels by site. Supply or give references for "normal" and max. levels for water turbity standards with other (i.e, D2, CO2, SO2, NO3, etc.,) as supportive material for extending the study for optimal proj.

Make sure the student group was able to handle an extra and activity project.

Let's look at the "whole picture" before we take a unit and try to generalize as much as we did.

Make the unit shorter by eliminating some of the activities.

Provide more factural information about water pollution and define some of the ambiguous terms such as water quality, etc.

I did not have water testing equipment so I modified unit to include all types of water pollution. Students then picked an area to research.

None. If a teacher is creative enough the possibilities of these units are endless. If anything, perhaps more teachers education.

None.

First of all I would change the title from "Phosphorus Leaks" to "Phosphates in Waters" because what we are checking for is not for phosphorus in waters but for the dissolved phosphate ion (usu. Ortho PO4). I think more background information as to what PO4-3, are, their source, their information, etc., on the introduction of the unit.

None I can think of! (Unless it would be to answer the chemistry questions on what precipitate if sormed and how do we know how much phosphate there is!)

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> Many students do not have the background to handle the material as written.
>
> If I taught it again I would strongly consider leaving part of it out or in some way modifying the unit, depending upon what grade level and class Issued it with.
>
> Equipment: Have more Hach Chemical test kits available (that work).
> Resource people: Needed a list of resource people.
> Teaching strategy: Students (advanced biology students) had difficulty answering the ambiguous questions in first part of Phosphorus unit.
>
> The great part in using the units is that very little equipment is needed and students can perform their work or most of it out of doors.
>
> Become familiar with areas of practical application in region.
>
> If using test kits, use fresh chemicals. Test kits are extremely easy to use, quite inexpensive ($6.50 in 1974) but are not real accurate. They should be adequate on the high school level though.
>
> Be sure and get lab equipment and supplies ahead of time.
>
> Trip to sewage disposal plant for discussion of treatment and problems.
>
> Comparison (1) of river (ind. and community discharge use) to non-use stream, (2) of highly developed lake to undeveloped.
>
> H2O testing by selected students, data shared by group.
>
> A movie on pollution would help.
>
> See the items on p. 7 concerning tours to sewage treatment plant, etc. Perhaps the Water Conservation Agent might alos be invited to speak to the class.
>
> 1. Have students bring in actual items used around home that have phosphorus and could end up in water supplies.
> 2. Use local PCA agent but could be anyone involved in water quality.
> 3. Field trip to treatment plant, esp. one with tertiary treatment facilities.
> 4. Survey soap products in local super market for comparison of phosphate contents.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

Because of the group of students which did this unit it was not completed and done in full. I would be more selective in the group next time.

I would like to see a list of all information and topics necessary to teach a EE course -- a (course description).

My class got to involved in part 1 and 2 of the activities they didn't want to move on to the other parts of the exercise. In fact, when we did move on to page 3 and 4 they were felt it was a kind of anti-climax or even probably an unnecessary part of the activity. However, when we got to the evaluation and discussion, things picked up again. The students were high achieving (mostly seniors) and this could have been an unfair test.

The unit is workable but needs to be revised, especially P. 2 questions. It takes an accelerated class to adequately field those questions.

Paragraph 4 and the related chart works real well as does #5, #6, and #7.

Next time I use this unit I plan on having the water quality testing kit. Then take samples from our school pond and other sites.

Many other possibilities come to mind while teaching these units that the teacher can implement. I like the basic "open endedness" of the units. With the right group of students you can really "go to town" with these units.

Since I teach an environmental studies course (and am working on my M.A. in environmental studies), I feel very strong about it. My students enjoy the course (I hope) and I like teaching it. I believe it should be required somewhere along the line K-12, hopefully in the elementary grades--each grade 1-6.

The students enjoyed the individual involvement in goal setting, label reading and pollutant seeking!

I think this unit should be more expanded to include the whole idea of water quality.

In my environmental course, I'm teaching to 14 freshmen and sophomores this year. I use Modern Lesson Plans in Environmental Science by Helen Hoch Kotsonis and Bill Baker by Parker Pub. Co., W. Nyack, N.Y. '72, as my resource book. I also have a very large file of material I have accumulated and sorted out for student reference work. We use many current periodicals and draw from books at our Media Center in Decorah. I often find too, that using ideas and suggestions from the students lends to some very exciting and interesting activities. They appreciate the opportunity to plan their own work at times. They also like to work in groups or sometimes individually on some topics of study.

Overall, good unit.

The success of this unit will depend on how involved the teacher has or is willing to commit to EE. To have a teacher try this one cold without pre-work on the environment may not produce good results.

Because of the importance of collecting run off water, recommend this unit be taught early fall or late spring. Also trips to lakes and on-site testing recommended over classroom work.

Student Feedback	Number	Percent
Number of students responding	49	100%
Number and percent of students who thought this Unit was worthwhile.	43	88%
Number and percent who would recommend this Unit to friends.	36	74%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	42	86%
No, I did not like it	3	6%
Don't know	4	8%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

There is more to pollution than I thought.

I am more aware now.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	21	44%
No	17	35%
Don't know	10	21%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

OK they way it is.

Should be more experiments.

Go into it a little deeper.

The Unit: CREATE A MAMMAL

Use of resource people and places in the 30 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	2	7%
Community	1	3%
Natural Resource	2	7%
Other	0	0%
I didn't use any	25	83%
Places		
School site	19	63%
Community	5	17%
Regional	1	3%
Other	3	10%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	27	90%	3	10%
The Goal statements were clear	29	97%	1	3%
The Activity Description was adequate	26	87%	4	13%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	15	94%	1	6%
The Evaluation Part was useful	23%	85%	4	15%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	4	13%	26	87%
I would teach this Unit again	28	93%	2	7%
I think this Unit depends on the use of sites	1	3%	19	97%
I think this Unit depends on the use of resource people	2	7%	28	93%
Goal statements were appropriate for grade/age level	28	93%	2	7%
Activities in the Unit were effective in helping students attain stated goals	29	97%	1	3%
Experience with this Unit has caused me to (or will) modify other courses I teach	10	36%	18	64%
Cost and availability of materials necessary to teach this Unit have been a problem	0	0%	29	100%
Most of my students were enthusiastic about the Unit	25	93%	2	7%
The Unit was easy to relate to the subject area I taught it in	26	90%	3	10%
The Unit is a valid environmental educational activity	30	100%	0	0%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	12	43%

The following are some of the additional materials that were used in the trial testing of this Unit:

A-V material.

Fitzpatrick, Hole - Modern Life Science, Holt

Biome filmstrips - several publishers.

The game "Extinction"

None.

Computer - simulation commun - (match animal with environment).
Actual specimens and parts.

Paper and crayons. Pictures of unusual animals.

Opaque projector.
Tray for each group of students with: drawing paper, colored chalk and pencil.

Slides of animals.

N/A

Tagboard
Color pencils or crayons
Library books

This particular project was very simple to work on in regard to availability of materials and subject matter.

None.

If using Mod. Earth Sci. (Holt, Rinehart Winston) 1973 ed. it fits best when using pages 312-313.

Textbook - Description, definition, taxonomy of mammal.

We had just completed a current science paper on the Smithsonian's created creatures from other planets - enthusiasm was high.

Only the use of reference books.

Pictures from media center.
Felt tip pens for drawings.

I used no other materials other than those recommended in the unit.

None.

Colored pencils.

Mammology Text, overhead projector, acetate prints. Strongly recommend that the unit should include several "ideal" make believe animals as prepared by experts! writing the unit. This will give the students a starting point.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

More introduction to unit. However, Sci. 7 "Life Sci." book was very valuable.

My students came up with "monster" type mammals. Should correct this.

Leave it flexible--as is--let the teacher use introduction as he wishes. His alter emphasis.

Emphasize that they are creating a mammal and not a reptile in the directions.

This section on "Survey of Body Parts"--clarify Appendage Types Part G. Non opposable digits. Distinguish between closely related parts, i.e., solid hoof vs. cloven hoof. Description of parts was only good points of the part, include some things its not good for.

Not requiring students to cut out scenes of different environments--I provided the pictures and we viewed them with an opaque projector. Too many classes have students cutting up magazines and the librarians don't appreciate it, nor do some parents.

None, I thought it was well presented.

More (if there are any) examples or pictures of the different types of parts of the mammal. We didn't feel that all the kinds of parts were included.

As a whole, I though the unit was very well set up.

None at this time.

A study of characteristics--kind and reasons--to give the students more insight. Their imagination is unreal at times.

The students need a good background in adaptation.

Provide adequate ecosystem pictures.

I would recommend additional information to the descriptions of major body parts that were included with the unit. I did not give the students enough time to seriously create their mammal.

None - This activity was excellent.

No major changes - unless made vocabulary for "parts description" more elementary.

2nd class - gave them felt tip pens because pencil drawings of 1st class hard to see.

I thought that the unit was effective the way it was.

None.

None.

Do after covering survey of animals.

I would not recommend any changes. It all went very smoothly.

Probably a small discussion or adaptation and environments would make the unit more clear before the animals are drawn. The unit in itself is quite complete.

The introduction is very inadequate. Should include a discussion of evolution, natural selection, behavioral and physical adaptations, etc. What is a mammal? How is it different from any other animal? Should list more examples of some obvious adaptation, i.e., snowshoe hares foot, tigers stripes, elephants tusks, etc.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> The students become more involved in creating a grotesque animal rather than one that was well-adopted to the habitat.
>
> It would be useful to go into detail with regard to the adaptations of a specific animal to a specific environment--for sake of illustration.
>
> Make mammal more realistic, not monster type.
>
> I used this exercise to help introduce a unit on endangered wildlife in an ecology course. The use of a computer simulation such as commun reinforces and builds on the goal. The presentation of actual specimens and samples helps interest.
>
> Emphasize that they are creating mammals.
>
> Would be better after study of biomes. Have examples of different kinds of mammals - especially the very early mammals now extinct.
>
> In teaching biology it fit in well with the materials I was teaching. We were just in the process of changing our point of view from ecological to anatomical. This was an excellent transition activity.
>
> Become totally familiar with it.
>
> Instead of the info sheets, overlays (transparencies) would be easier to use. (I realize that costs more money!) Actual drawings showing foot prints of the different mammals would have been informative.
>
> Use large sheets of paper or tagboard for mammals. Have student make up their own name for the mammal. Library is a good source for further information.
>
> Let students work alone if they wish. Don't over-teach the unit.

If using Mod. Earth Sci. (Holt, Rinehart Winston) 1973 ed. It fits best when using pages 312-313.

Add more information on mammals. Point out reasons for more characteristics. Use encyclopedias for the information.

Give the students adequate time to develop the unit.

Provide adequate ecosystem pictures.

I'd include statements on tails and hair.

I think it is hlepful to have some reference books on mammals available while they are working on their survey of the function of major body parts.

Be sure to envolve all students, not just the artists.

Markers make pictures easier to see. Need more time than you first anticipate. One class drew, next class explained, vote, discuss p. 8-9-10.

The teacher should reinforce the fact that the mammal drawn should have the adaptations shown in the drawing.

Review characteristics of mammals.

This unit would be most useful it it were taught following a unit in adaptive radiation of mammals.

Use of bones and live animals to emphasize animal components. Have students color animal - gives them added insight to protective colorations, mimicry, etc.

Extremely important to outline what mammals have that no other mammals have, i.e., hair, mammary glands, four chambered heart, sebaceous glands, etc. Found that the students especially enjoyed getting into a discussion of physical and behavioral adaptations that people have.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

This unit might possibly be taught from the angle of association of real animals with habitats.

Real fine idea, for several different science courses we teach. The emphasis can be shifted, i.e., structure - zoology, survival adaptation - ecology biology.

Good little unit. Can border on extreme if you don't make some effort to hold students to goal.

Evaluation - a bit weak - can be done in a minute. Matching long lists of animals via computer maintained interest and reinforced goals while serving as an evaluation tool.

Because more than one section of students were involved in this activity, at its conclusion we put the pictures on the wall under the respective categories: forest, desert, grassland, etc. Students then had an opportunity to compare a number of animals all from the same environment.

Time was short. In a one-hour class it took 30 minutes to look at pictures of different environments and discuss the survey sheets on body parts. This left 30 minutes for students to select environment, body parts and make drawing. Most did finish.

One more class (1 hour) was used to examine and defend designs.

I didn't feel the assigned units were appropriate for my science classes. Biology classes would have benefited more. A "general" kind of environment unit would have been easier. This topic did not provide me with ease in teaching. I could not rely upon my experiences to answer the kids' questions. When I did answer, I felt uneasy and somewhat unsure of my answers.

My other assigned unit was not completed because we did not have the equipment that the unit asked for (camera). Because our school is small with an even smaller budget, this unit could have been an "elected" unit.

I have one other question. Why did I not receive any information on this project? I did not know how to do this unit, with whom, or why? I would have appreciated a letter introducing the project and asking me if I were interested (which I would have) not telling me to do so many units. I'm not saying it was your fault or someone in our school, but next time I will refuse to go through with such an unorganized situation or project.

This particular project was very simple to work on in regard to availability of materials and subject matter.

I think awareness is perhaps the most important part of environmental education and should be (and is, I think) brought in in all grade levels and subject areas.

More information should be made available as to the value of different characteristics, possibly include nonmammal like characteristics.

Perhaps this is too difficult for 7th graders. Their reasoning seems inadequate for this type of project. This may be due to all the science fiction seen on TV these days.

Good activity. Will use again.

Thank you for allowing me to participate in the Minn. EE P.

This activity was well received by the students and they enjoyed it. This is an activity that I would like to continue next semester.

Well received by groups.

Will use again when study mammals.

The vocabulary below the pictures of the parts was much too difficult for 7th grade students.

I thought that this was a very good unit. The students enjoyed it and from their evaluation I could tell that they learned something.

I plan on adding this unit to my list of activities.

It is fine the way it is.

Thanks again for your work and efforts in this area.

In the final evaluation I think it would be a good idea to have students describe their animal and explain the various aspects of it relating to the stress their animal will interact to in its environment.

Very interesting and well done unit.

This unit worked well in 7th Life Science. Students that generally do not well in a regular class situation did well in this unit. Everyone got involved and participated in presenting their mammal to the class. At the end of the unit, each group had to present their mammal to the whole class, and be able to defend it to the environment. The class was asking the groups various questions about the mammal, asking why the parts were suited to that environment. It was an exciting unit, and will definitely try it again.

Did not ask students to bring pictures of different environments. They would think that is very stupid, elementary and probably would get the unit out to a bad start.

Student Feedback	Number	Percent
Number of students responding	121	100%
Number and percent of students who thought this Unit was worthwhile.	105	87%
Number and percent who would recommend this Unit to friends.	81	68%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	105	89%
No, I did not like it	4	3%
Don't know	9	8%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

It was fun.

A good chance to use my imagination.

It really made you think how animals are suited to their environment.

It was a totally different concept of working on a specific topic. The change was refreshing.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	22	18
No	82	68
Don't know	16	14

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

It's fine the way it is.

More variety or different shapes.

I would make it longer.

Have two or three work on one animal, not everyone.

The Unit: INTERSTATE HIGHWAY

Use of resource people and places in the 23 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	3	13%
Community	1	4%
Natural Resource	0	0%
Other	0	0%
I didn't use any	9	83%
Places		
School site	14	61%
Community	5	22%
Regional	1	4%
Other	2	9%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	18	86%	3	14%
The Goal statements were clear	18	86%	3	14%
The Activity Description was adequate	14	64%	8	36%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	11	79%	3	11%
The Evaluation Part was useful	20	91%	2	9%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	7	32%	15	68%
I would teach this Unit again	18	82%	4	18%
I think this Unit depends on the use of sites	7	32%	15	68%
I think this Unit depends on the use of resource people	4	18%	18	82%
Goal statements were appropriate for grade/age level	17	77%	5	23%
Activities in the Unit were effective in helping students attain stated goals	20	91%	2	9%
Experience with this Unit has caused me to (or will) modify other courses I teach	5	23%	17	77%
Cost and availability of materials necessary to teach this Unit have been a problem	1	4%	2	96%
Most of my students were enthusiastic about the Unit	17	77%	5	23%
The Unit was easy to relate to the subject area I taught it in	15	68%	7	32%
The Unit is a valid environmental educational activity	20	91%	2	9%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	6	27%

The following are some of the additional materials that were used in the trial testing of this Unit:

Films: air pollution, water pollution, insecticides.

Paper, paraprofessional help.

None.

Bibliography is attached. It includes: books, periodicals, filmstrips and tapes.

None as yet.

None.

None.

Decibel scale from "Ecology, Pollution, Environment," by Tuck, Tuck, and Wittes; Saunders Company, 1972.

I would use:
    slides, maps, etc., of my actual area
    toak about hearings, etc.
    What is "adverse" CO level, Pb, - What happens to people?
    Include this for others.

We made labels for each community.

None.

Magazines - articles.

Various pamphlets on urban and suburban transportation.

We felt that the materials provided for us were sufficient.

None.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

Because Cambridge is rural, students are not familiar with environmental problems of interstate systems. Students have to have a first-hand experience. Films provide some information but are not that effective.

None, except include some comment on the validity and sample member before making definite statements from the results of people interviewed.

If taught in the Twin Cities, name the four affected communities. It makes the activity much more real to the students who line in the Twin Cities.

Change from metropolitan orientation. Roads construction a general problem, i.e., straightening curved rural roads w/conflicting values outcomes (increased safety vs. loss of aesthetic values, ex. Effie red pine stand; designated fund for road development vs. need retaining local desires; improved roads - increased travel - decreased rural atmosphere; decreased habitat due wider right-of-way and reverting federal and state roads to county and state maintenance rather than replacement.

More time in having students representing the four different communities prepare for the public hearing.

The role-playing idea apparently was quite new to them and some had difficulty adjusting to this. Some were confused on exactly what their objective or assignment was. I would make this more clear next time.

None.

It has to be altered to fit the age levels to which it is offered.

I don't really know yet.

None.

I think it is good and my students liked it.

Data provided the students could have been made easier for them to understand. This was true for only some of the items.

I would suggest that you provide some reference material as to the good or bad of the highway decision, filmstrips, film, etc.

Explain, in the introduction, what constitutes high CO levels, high sound levels, etc. Students who live in rural areas have no idea what these levels mean.

For the junior high level:
1. Simplification of language.
2. Visual materials would be helpful.
3. Better layout of communities.
4. Adapted for use with 30 students.

Give total population of communities.

Better instructions on how to get the unit started.

Make it more clear. Alternatives were difficult for us to comprehend.

Much more background material in urban and suburban problems, public transportation vs. private transportation, and urban renewal.

Make description of problem more clear (What is Alt. 1? What is Alt. 2? etc.)

I felt that it would have been more beneficial to the student if they could be divided and were made aware of the fact that some were definitely going to lose their homes and jobs.

The neighborhood part (introduction) of the present was not deep enough. For example, you mentioned $7,000 for low income but nothing for upper middle income. Why not specify one area as mostly of elderly or another as low income. Why the sound in the neighborhood part. (I was lost.)

The unit is not appropriate for 10th grade biology. It would be more appropriate in 12th grade social studies.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

More first-hand pictures and information on the actual freeway system.

Information from environmental agencies, noise pollution, etc.

I had students interview students in grades 9, 10, 11, 12 and adults under 30. I then calculated percentages--yes and no--and compared their responses. A copy is included with this form. The students did the tabulations and percentage work. It helped them in their math and reinforced this skill.

Ask someone from the highway department to come in to give the background material. Also have students attend a community city council meeting where the community is making decisions on an issue.

More time in having students representing the four different communities prepare for the public hearing. Minimum of 2 days outside of class.

The role-playing idea apparently was quite new to them and some had difficulty adjusting to this. Some were confused on exactly what their objective or assignment was. I would make this more clear next time. In addition, I would like a follow-up of perhaps resource people for such as highways, environmentalists, community growth as mayors, etc.

Let the students do it on their own. Let them be creative in their thinking.

Resource people would do much to implement this unit. I did not have early notice so I could prepare for speakers. Two units were too much for the time allowed.

Keep an open mind when discussing each community. Let the students carry the debate.

To me a map of the area would have been useful.

None.

Not as yet.

Act like a creeping enzyme or catalyst when the groups are preparing for the public hearing on the issue.

Let the student proceed at his own rate.

I spent quite a bit of time providing a background for the unit drawing on the experiences of the students and myself, since the unit did concern an actual situation with which I was somewhat familiar.

Develop an interest in the subject before teaching it.

If kids are unaware of what a decibel scale is, it would probably be a good idea to put one on the blackboard with references to common sounds. I used the one from "Ecology Pollution, Environment," by Tuck, Tuck, and Wittes; Saunders Company, 1972.

Data sheets for students were hard to grasp. Need quite a bit of time here.

I had students play roles of specific people that might live in the area. They enjoyed this.

Develop an entire unit. Photos, maps of area. I personally am involved with highway dispute, and students most interested in this. I did NOT attempt to use this much. Attempted to stay only with materials.

If possible, use a room in which group discussion can easily be done.

Make certain what you want us to teach in such a unit.

Make a special unit on all means of transportation (water, air, and land). Include this as part of the unit on land transport.

Make a copy of "Present and Future Conditions" for each student.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> First of all I would like to apologize for being so late with returning these materials. There was some confusion on the assignments received. The one intended for Janis Krall was not completed. She felt that this was out of her area and could not do an effective job. In turn, Janice completed the unit intended for Dick Hardy. This unit was more in line with her teachings. Mrs. Cheins, Dick Zalusky's, George Larson's and mine, Ken Dean were completed. In general, the students liked the work on the units.
>
> An excellent activity and fun to d!
>
> The unit was well accepted and pertinent to today's problems.
>
> Perhaps should be integrated in social studies class in units on communication, transportation, and urban problems.
>
> Difficulty integrating in biology course with limited structure available to specified and developed lab-oriented curriculum.
>
> Unit of regional interest to metropolitan districts. Had to apply to local and regional problems to elicit interest.
>
> Students were very excited about the public hearing and really did get involved in the role playing. They took their roles seriously and did an excellent job. I'm personally very excited about this unit.
>
> Suggestion!! In doing the mock public hearing have a reel to reel tape recorder set up and a microphone and USE IT!! It adds a touch of realism to the unit and does make it more meaningful.
>
> P.S. I've enjoyed teaching these units.
>
> I am not enthusiastic about simulations. I am not convinced these are an effective teaching instrument. I have tried several and on only a few occasions did I feel they were moderately successful.
>
> I rather like a unit such as this since it does involve real problems, is very open ended, involves other disciplines, can be adjusted to almost any level of sophistication, and provides for student involvement to individual interests and abilities.
>
> A very good unit, however, a good discussion as to what environmental education is is essential. I had one student think that EE is just about wildlife.
>
> Recommend it for all age levels, but it should be geared and so specified for which level.
>
> Reach the upper classmen first. They showed interest in the units. Upper level teachers should have been given the opportunity first.

Because I got this material over one month late this unit is not completed, yet.

It may sound strange to use this unit in a physiology class but the students enjoyed it and did some research on lead, CO and other pollution on the body systems. Even some looked into some information concerning sound pollution on human behavior.

It seems that it would be beneficial to have included in the unit a little more background information dealing with this highway situation. Many students asked questions that were unable to be answered with the amount of information given.

Most of my students seemed quite eager to participate in discussions of this topic and most of them seemed quite interested.

I enjoyed the unit but some of my students would have liked a bit more physical activity other than discussion.

This unit is excellent for use in junior and senior high ecology classes, but is probably better suited to senior high 11th and 12th grade students. It makes them think, and it shows what group efforts are really like. They realized that getting a bunch of other people to agree with you on a certain idea can really be a problem, and how to combat this problem, or change your views.

However, I believe more background information should be provided in the introduction as I explained in No. 1 (re high sound levels, etc.) Otherwise, a very good and useful unit.

A comment most students made was the difficulty of deciding which choice to make when there were so many views.

This unit tried in two classes - 10 students only. It worked well in two class periods. Although more time would be helpful with use of supplemental materials.

Needs to be geared to classes of 30 students. It isn't. I.e., - breakdown of 30 students into 4 groups too many people. Groups of 4 OK.

We set up a city council that held a hearing and listened as each community expressed its opinion. The students really got involved!

Overall, I thought the unit was a good exercise. The students responded well once they realized some of the problems that would occur with their decision.

I spent many hours reading, analyzing what was wanted and really didn't understand what was desired.

I gave out instructions to 4 groups. They met and read and discussed each area with many questions I could not answer. They were just as confused as I was, maybe more so.

Perhaps you people understand your unit, but I'm confident few people will be able to get much out of this. We tried to present this to our class, with lots of enthusiasm, but again objectives were not clear to us. I'm sure this can be greatly improved upon for future use.

I think it is a very good idea to use role playing in an environmental issue such as this. Even though we are over 100 miles from the nearest Interstate highway, the students became very involved in their role playing situations. Role playing would be a good approach to teaching other units in environmental units.

(The other units offered to me have already been covered during this school term, so I did not use them.)

Terms like luxury apartments, racket ball club, tot lots, bothered me. Away from the Twin City Area, they mean something different or even alien. My students learned a little about big-city life which may have affected the environmental part. This distraction should be changed.

I felt that I had to put too much input into the unit to keep it going and my prejudice must have had some influence.

Student Feedback	Number	Percent
Number of students responding	74	100%
Number and percent of students who thought this Unit was worthwhile.	67	91%
Number and percent who would recommend this Unit to friends.	57	75%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	64%	84%
No, I did not like it	9%	12%
Don't know	3%	4%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

It was a good experience.

Pointed out many ideas about an issue.

Gave our class a chance to express their views.

I found that decisions are not always easy.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	36	49%
No	27	36%
Don't know	11	15%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Have more debate.

More time to get ready for the hearing.

Leave it the way it is.

Have "for" and "against" groups.

The Unit: INTERDEPENDENCY

Use of resource people and places in the 6 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	1	17%
Community	0	0%
Natural Resource	1	17%
Other	1	17%
I didn't use any	5	83%
Places		
School site	4	67%
Community	0	0%
Regional	0	0%
Other	0	0%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	5	83%	1	17%
The Goal statements were clear	5	83%	1	17%
The Activity Description was adequate	2	40%	3	60%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	3	75%	1	25%
The Evaluation Part was useful	3	60%	2	40%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	2	34%	4	66%
I would teach this Unit again	3	50%	3	50%
I think this Unit depends on the use of sites	2	33%	4	67%
I think this Unit depends on the use of resource people	1	17%	5	83%
Goal statements were appropriate for grade/age level	1	17%	5	83%
Activities in the Unit were effective in helping students attain stated goals	1	20%	4	80%
Experience with this Unit has caused me to (or will) modify other courses I teach	1	20%	4	80%
Cost and availability of materials necessary to teach this Unit have been a problem	1	17%	5	83%
Most of my students were enthusiastic about the Unit	2	40%	3	60%
The Unit was easy to relate to the subject area I taught it in	3	50%	3	50%
The Unit is a valid environmental educational activity	5	83%	1	17%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	2	40%

The following are some of the additional materials that were used in the trial testing of this Unit:

I have enclosed a sheet of terms that my students used prior to the exercise.

I used diagrams and charts and transparencies on interdependency that I used in my ecology unit to help illustrate the idea and to give examples as sort of an introduction.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

> I would strongly suggest this unit be used at a lower grade level. It is an overstatement of the obvious to seniors. Also the activity description need be better defined. Does dependency imply interdependency?
>
> I think that the open-ended sentences weren't explicit enough. The students were confused as to the meaning--i.e.
>
> The students (8th) thought it was rather juvenile as they often do. They did learn from the unit, but I definitely was aware of them commenting on the fact that they felt it was below their age level.
>
> I just really question the interest of this unit as far as the way it is presented. I do feel it could be reworked into a unit of more depth for that age group.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> I would strongly suggest this unit be used at a lower grade level. It is an overstatement of the obvious to seniors.
>
> I might suggest using A-V material prior to the exercise, or have a speaker on conservation, ecology, or environment.
>
> Give plenty of examples of interdependency in your preliminary introd. materials. Try and use examples of interdependency that fit your region using familiar animals and situations.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> Being involved in the actual medium of environmental education is the most fun for the student and also probably a greater learning experience. Usually, however, funds, time and restrictions unforseen tend to hamper attempts to get out "in the field" to show or reinforce classroom experiences.

Student Feedback	Number	Percent
Number of students responding	17	100%
Number and percent of students who thought this Unit was worthwhile.	14	82%
Number and percent who would recommend this Unit to friends.	11	65%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	14	82%
No, I did not like it	0	0%
Don't know	3	18%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

I liked it.

It was interesting to see how dependent we are.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	5	29%
No	9	53%
Don't know	3	18%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Make the roles a little more clear.

It should be used in grade school.

There should be more activities.

The Unit: OUR DESIRE FOR A BETTER WORLD

Use of resource people and places in the 5 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	0	0%
Natural Resource	0	0%
Other	0	0%
I didn't use any	5	100%
Places		
School site	5	100%
Community	0	0%
Regional	0	0%
Other	0	0%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	5	100%	0	0%
The Goal statements were clear	5	100%	0	0%
The Activity Description was adequate	5	100%	0	0%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	5	100%	0	0%
The Evaluation Part was useful	5	100%	0	0%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	1	20%	4	80%
I would teach this Unit again	5	100%	0	0%
I think this Unit depends on the use of sites	1	20%	4	80%
I think this Unit depends on the use of resource people	1	20%	4	80%
Goal statements were appropriate for grade/age level	5	100%	0	0%
Activities in the Unit were effective in helping students attain stated goals	5	100%	0	0%
Experience with this Unit has caused me to (or will) modify other courses I teach	3	60%	2	40%
Cost and availability of materials necessary to teach this Unit have been a problem	0	0%	5	100%
Most of my students were enthusiastic about the Unit	4	100%	0	0%
The Unit was easy to relate to the subject area I taught it in	3	75%	1	25%
The Unit is a valid environmental educational activity	5	100%	0	0%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	1	20%

The following are some of the additional materials that were used in the trial testing of this Unit:

Knowledge of world energy and food shortages.

I enclosed a list of terms with my assigned unit.

I used ideas from an ecology unit put out by the Coca Cola Company in 1972 which allowed students to act as a group to change their environment for better or worse by voting as a village or city might do to approve or disapprove buildings, factories, parks, land fills, dams, zoos, housing developments and so on. They learned graphically the power of public pressure in environmental law making. The arguments and bargaining and general enthusiasm and competition were keen. A bright colored magnetic board came with the kit and features (those mentioned above) could be added or removed from the playing board easily.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

None that I could see.

Spending more time with the introduction. Find a more objective method of evaluating. I question the value of having the students rate how our Country would rate these priorities.

To allow for additional time especially for the discussion portion of the comparison of priorities and the evaluation.

You might include a few different examples or priorities on the list which the 13-14 year old might more closely identify with.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Be prepared to answer lots of questions without giving personal value judgments.

Spend more time with introduction. Find a more objective method of evaluating. I question the value of having the students rate how our Country would rate these priorities.

Obtain a film about one or two of the priorities that the student will be working with. Review various terminology that will be used (or relate to) the unit.

I used ideas from an ecology unit put out by the Coca Cola Company in 1972 which allowed students to act as a group to change their environment for better or worse by voting as a village or city might do to approve or disapprove buildings, factories, parks, land fills, dams, zoos, housing developments and so on. They learned graphically the power of public pressure in environmental law making. The arguments and bargaining and general enthusiasm and competition were keen. A bright colored magnetic board came with the kit and features (those mentioned above) could be added or removed from the playing board easily.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> This unit worked out better because it did not make use of limited resources, but was not as stimulating to the students because of lack of background.

Student Feedback	Number	Percent
Number of students responding	25	100%
Number and percent of students who thought this Unit was worthwhile.	20	80%
Number and percent who would recommend this Unit to friends.	20	80%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	21	84%
No, I did not like it	4	16%
Don't know	0	0%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

It was a change of pace.

It was dull.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	9	39%
No	12	52%
Don't know	2	9%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Better explanation.

Filmstrips would help to get ideas across.

Have more things to do.

More detail and time.

The Unit: A DIFFERENT PERSPECTIVE

Use of resource people and places in the 9 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	2	22%
Community	3	33%
Natural Resource	0	0%
Other	0	0%
I didn't use any	5	56%
Places		
School site	8	89%
Community	4	44%
Regional	0	0%
Other	0	0%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	5	56%	4	44%
The Goal statements were clear	7	78%	2	22%
The Activity Description was adequate	4	50%	4	50%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	6	67%	3	33%
The Evaluation Part was useful	6	67%	3	33%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	8	89%	1	11%
I would teach this Unit again	7	78%	2	22%
I think this Unit depends on the use of sites	5	56%	4	44%
I think this Unit depends on the use of resource people	3	38%	5	62%
Goal statements were appropriate for grade/age level	6	67%	3	33%
Activities in the Unit were effective in helping students attain stated goals	4	44%	5	56%
Experience with this Unit has caused me to (or will) modify other courses I teach	2	22%	7	78%
Cost and availability of materials necessary to teach this Unit have been a problem	3	33%	6	67%
Most of my students were enthusiastic about the Unit	6	75%	2	25%
The Unit was easy to relate to the subject area I taught it in	9	100%	0	0%
The Unit is a valid environmental educational activity	7	78%	2	12%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	4	44%

The following are some of the additional materials that were used in the trial testing of this Unit:

Perhaps slides or a large blow for the wall would work.

Only my own experiences.

Topographic maps.

Opaque projector.
Field trip to check what was seen in the pictures. Student reports (groups of 5 or less).

None.

Larger aerial photographs; opaque projector to orientate students to recognizable features.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

Must have many copies of the air photos of Olivia and the larger city.

Why use a small community--most students will not be living there. Aerial maps were incomplete (too distant).

Too short of time period alloted--if other resource materials are to be used. Goal statements are too vague (ex., what similarities).

Goals more specific.

More background information.

More detailed aerial photos (smaller scale).

Provide more than one map of each area so that the entire class can participate.

Better introductory instructions. Give some examples to follow.

I would recommend that you include an aerial view of a city other than the community to help facilitate implementation of this unit.

Materials as provided in the unit were too few for the number of students I had to work with.

1. Larger maps of home area.
2. Data sheets for second half of activity so students can list changes and reasons why.
3. Map of second environment should be labeled so students know location.
4. Need a more detailed explanation sheet for teachers who may be unfamiliar with the aerial photography. List recognizable features.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Should have pair of pictures for each person or small group. Impossible to do with just one of each.

Have only ten students in class. This is a mas.
Use a magnifying glass for maps.
Use at grade 8 or lower level.

Equipment difficult to find.

I think one of the resource people you have to have would be an assessor to help with description of land.

Use with topographic and possibly geoligic maps.
Use groups of no more than 3.

Allow more time than is recommended.

Have students grouped (in 5 to less) to facilitate implementation. When students are in small groups it helps them.

Give them at least a week.

Small groups work best, have plenty of duplicates, keep discussions short and directly to the subject or questions.

Students tend to get discouraged easily because of lack of activity and short supply of maps. Problem could be solved by further dividing groups and providing additional maps so students can change their environment as teams. Four people per map was too many and as a result students got bored.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

Had trouble finding aerial photos of our area.

Make peace with the earth.

The Minnesota environmental education problem seems nebulous at this time. It will be interesting to see the results of the project.

The time seemed too short. I think the projects should have been geared to at least a week each.

Whole unit is too vague. Many students today do not know which end is up because activities have been too vague. Be more specific with goals and activities.

Environmental ed should be worked into discipline being taught and not be an extra set aside unit. For example, all disciplines of science or the social sciences can handle it. When is the State Department going to get organized on this junk and stop going about it in a hap hazard method.

I wasn't impressed with the unit, the students were not enthused at all. They enjoyed seeing our community but didn't seem to understand what was meant by use of land. I feel the photographs were too difficult to see what the areas were actually used for.

Georgaphy, civics and government teachers have been doing this sort of thing for years, or should be.

Environmental ed. has always been a major part of my teaching--this particular unit would be outstanding in teaching of local community and comparison of urban and rural areas from a traditional government civics class course.

I thought it was a good unit. I just wish I had had more aerial photos to make the groups smaller. I don't feel my students got enough time with the two I had. Perhaps a list of places where these types of photos are available would be helpful. The kids enjoyed looking at their own town.

First section of form isn't filled out because it doesn't pertain to my situation. I'm a naturalist at the Doge Nature Center and teach a variety of subject areas. I assisted Harriet Johnson at Grass Jr. High and we split the class and conducted the activity in separate classrooms.

Student Feedback	Number	Percent
Number of students responding	41	100%
Number and percent of students who thought this Unit was worthwhile.	34	83%
Number and percent who would recommend this Unit to friends.	24	59%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	34	83%
No, I did not like it	3	7%
Don't know	4	10%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

Interesting to see differences in the two towns.

Gives a broader view.

Views people give are extremely interesting.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	16	39%
No	16	39%
Don't know	9	22%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Better maps.

Good the way it is.

Have more to do.

The Unit: MOTHER OF THE YEAR

Use of resource people and places in the 16 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	2	13%
Community	0	0%
Natural Resource	0	0%
Other	0	0%
I didn't use any	14	88%
Places		
School site	13	81%
Community	3	19%
Regional	1	6%
Other	0	0%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	13	81%	3	19%
The Goal statements were clear	14	88%	2	12%
The Activity Description was adequate	11	73%	4	27%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	8	89%	1	11%
The Evaluation Part was useful	12	80%	3	20%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	3	19%	13	81%
I would teach this Unit again	13	81%	3	19%
I think this Unit depends on the use of sites	2	13%	14	87%
I think this Unit depends on the use of resource people	2	13%	14	87%
Goal statements were appropriate for grade/age level	15	94%	1	6%
Activities in the Unit were effective in helping students attain stated goals	11	69%	5	31%
Experience with this Unit has caused me to (or will) modify other courses I teach	3	21%	11	79%
Cost and availability of materials necessary to teach this Unit have been a problem	2	12%	14	88%
Most of my students were enthusiastic about the Unit	10	63%	6	37%
The Unit was easy to relate to the subject area I taught it in	12	75%	4	25%
The Unit is a valid environmental educational activity	10	63%	6	37%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	4	27%

The following are some of the additional materials that were used in the trial testing of this Unit:

66 Sisters from Herstory (interact)
Contact Projects from Herstory

None.

None.

None, but I should have brought in a few people from the community to get their opinions.

Tag Board)
Magic markers) For Mother of the Year slogans

ZPG materials.

None.

Newspaper and magazine articles.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

None...Good maximum participation activity.

More than one person should be allowed to go before the National Selection Comm. to present their arguments. It was difficult to get only one person to present the arguments of their group. They were afraid. Be sure to devote enough time to the unit.

More material is needed or more background for students to use more current articles in newsmedia.

None.

Very skimpy unit - must be improved.

More variety in candidates.
Give the class a formal "contest" setting.

Give more information about the mother.

More information, or more flexibility is needed on dealing with the candidates.

None, I thought it was great. My students seemed to think they needed more information about each mother.

More information could be gathered, as was previously mentioned.

More time.

Supply information for each participant.

More information on values clarification. Possibly and interactive group role play to show importance of most values.

Better description of mothers and more information.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Don't use it. Students saw no use for it.

Give each student a copy of all data bout each woman.

None.

When putting the data together there are times when whole sections (classes of 25-30) cannot be kept busy.

None.

Choose council members carefully--must be outgoing, leaders, opinionated. Have each participant contact the person she is representing to get more information on the subject.

I kept judging team in separate rooms, plus used sets of 8th graders from study hall as judging and reacting units.

The teacher's enthusiasm helps motivate the students. Let the National Selection Committee meet in private to make their choice but make them reveal everything about their meeting.

Use small and large group instruction - vary the setting.

Locate your group closer (350 miles) to resource people, equipment, etc.

None.

Add to it - too brief.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> I feel I did not do justice to the units because of time. I had some long-range plans that meant they had to be crowded in.
>
> This could be a very good unit. I used it in the 8th grade with an all girl class. Their knowledge was very limited on the subject. If I did it again I would either use older, more aware students or a co-ed class of 8th graders.
>
> This can be implemented into a social studies program more in depth.
>
> The students were enthusiastic and interested in the unit. They worked well in the groups, however, they were reluctant to have only one person appear before the National Selection Committee. I had the National Selection Committee in another room where they listened to and questioned the representatives from each group. I feel that I learned quite a bit from the first time we tried the unit. I did not devote enough time to the unit. We had just finished an extensive uniteon teenagers and the law. Some of the students related this to our law unit. The first time I used the unit I do not feel I achieved all the goals of the unit. The unit was somewhat difficult to relate to some of the units I'm presently teaching. The topic was conducive to discussion and the students responded well.
>
> "The Mother of the Year" contest I don't think really had much to do with environmental education.
>
> Some interesting discussion developed and questions as to values and life styles, but I didn't feel that there was much change in established stereotypes.
>
> Most of the students expressed strong feelings toward traditional roles. This activity seemed to reinforce these feelings.
>
> Has nothing to do with environmental education.
>
> Some students found it difficult to relate a mother of the year contest and sex role stereotyping to environmental problems.
>
> Excellent unit - had no trouble motivating students. They gained greater insight not only in stereotypes but about their mothers. There is no way to measure how far the influence of this unit will go.
>
> Additional materials (detail) for providing the pupil analysis of role assessment and how they are learned.
>
> In a small community, this unit, once done, need not be done again for several years, because the data is now available. I have the feeling that the students are getting sick of environmental units. They are getting it in several classes and are being saturated with it.

Student Feedback	Number	Percent
Number of students responding	54	100%
Number and percent of students who thought this Unit was worthwhile.	31	57%
Number and percent who would recommend this Unit to friends.	29	54%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	35	65%
No, I did not like it	13	24%
Don't know	6	11%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

"Lots of laughts! Lots of fun!"

"...it was a waste of my time."

"...it was different from the usual."

"I learned some of the dumb ideas my classmates have."

"...made me more aware of some of the problems in the U.S. today."

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	25	47%
No	18	34%
Don't know	10	19%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

"The game should be longer..."

"The unit is fine the way it is."

"More material."

"More contrast in the mothers."

"More detail in candidates."

The Unit: CEMETARY

Use of resource people and places in the 9 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	4	44%
Natural Resource	0	0%
Other	0	0%
I didn't use any	5	56%
Places		
School site	2	22%
Community	9	100%
Regional	1	11%
Other	0	0%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	7	78%	2	22%
The Goal statements were clear	9	100%	0	0%
The Activity Description was adequate	8	89%	1	11%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	8	100%	0	0%
The Evaluation Part was useful	8	89%	1	11%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	2	22%	7	78%
I would teach this Unit again	8	89%	1	11%
I think this Unit depends on the use of sites	9	100%	0	0%
I think this Unit depends on the use of resource people	2	22%	7	78%
Goal statements were appropriate for grade/age level	8	89%	1	11%
Activities in the Unit were effective in helping students attain stated goals	8	89%	1	11%
Experience with this Unit has caused me to (or will) modify other courses I teach	3	43%	4	57%
Cost and availability of materials necessary to teach this Unit have been a problem	0	0%	9	100%
Most of my students were enthusiastic about the Unit	7	78%	2	22%
The Unit was easy to relate to the subject area I taught it in	7	78%	2	22%
The Unit is a valid environmental educational activity	7	88%	1	12%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	3	33%

The following are some of the additional *materials that were used in the* trial testing of this Unit:

Information concerning the reasons for death, from the death certificates.

Information concerning the births from birth certificates.

Some questions as mentioned previously.

Computer.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

More explanation concerning how many headstones should be used.

Better instructions.

It seemed to me that data sheet number 2 could only be completed after data sheet number 3, and logically they should have had the reverse numbers.

1. Suggest students take data from every stone.

2. Students should more randomly in patterns criss-crossing cemetery to gather data from all sections.

3. Have students go over data in pairs - in groups of tens and large group. Suggest reasons why data changes.

I think I would like to see its scope expanded beyond the data-gathering direction that it has. For one thing, I'm not sure the sample makes the data valid, and for another, I think the real impact would be if the students could become aware of the factor that those people buried were in the community.

I wouldn't make any changes. The unit is fine the way it is.

A short study of a cemetery, terminology, etc. What to expect.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

Use a large cemetery, more than say 30 or 40 headstones from all centuries.

Use a very old cemetery.

1. Have someone explain %'s before going to the class.
2. I did this with several classes and duplicated the sample graph onto a poster and discussed this information with the class. There are many questions that can be raised.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> Students enjoyed the cemetery very much and even the rowdiest students were respectful when it was suggested that people's friends and relatives are buried there.
>
> The students were enthused about this unit and seemed to enjoy doing it.
>
> The project provided motivation. It used several skills in application that students were not aware of: Examples--math in addition and in percentages; graphing; writing; responsibility; social awareness; and a group effort requiring coordination. This made it effective.
>
> Also getting out of the classroom pleased most students. They saw an activity. We combined an English and a social class to have two hours out on the trip to gather information. This helped solve confusion and gave us more time to gather information.
>
> I used as my assigned unit "Mother of the Year" and my elected unit "The Cemetery" due to the problem of transportation on the part of many students.
>
> Also due to the fact some of our cemeteries were old I do not feel we were exposed to a general sampling of data concerning population.

Student Feedback	Number	Percent
Number of students responding	35	100%
Number and percent of students who thought this Unit was worthwhile.	26	74%
Number and percent who would recommend this Unit to friends.	16	46%

DISTRIBUTION OF STUDENT EXPRESSIONS OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	29	83%
No, I did not like it	2	6%
Don't know	4	11%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

It was different.

It was entirely too much busy work.

It was enjoyable and interesting.

It made me more aware of the population problem.

It doesn't thrill me to hang around places like that.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	15	43%
No	14	40%
Don't know	6	17%

Students were asked for comments relative to Unit changes. Some selected ones are listed here:

A better cross-section. . .

Not so much busy work.

Can't think of any.

All right the way it is.

You should make it more fun.

The Unit: WE WOULD LIKE TO DO SOMETHING

Use of resource people and places in the 4 trial tests of the Unit.

NUMBER AND PERCENT UTILIZING RESOURCE PLACES AND PEOPLE IN THE TRIALING PROCESS

Resources	Number	Percent of total number field tested
People		
Education	0	0%
Community	0	0%
Natural Resource	0	0%
Other	0	0%
I didn't use any	4	100%
Places		
School site	4	100%
Community	0	0%
Regional	0	0%
Other	0	0%

The Unit's Implementation

OPINIONS OF TEACHERS RELATIVE TO THE PARTS OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
The Introduction was adequate	4	100%	0	0%
The Goal statements were clear	3	75%	1	25%
The Activity Description was adequate	4	100%	0	0%
The Data Sheet/Worksheet was useful (Respond if they were included in the Unit)	0	0%	0	0%
The Evaluation Part was useful	2	50%	2	50%

OPINIONS OF TEACHERS RELATIVE TO THE IMPLEMENTATION OF UNIT

	Agree		Disagree	
	Number	Percent	Number	Percent
I had problems implementing this Unit	3	75%	1	25%
I would teach this Unit again	3	75%	1	25%
I think this Unit depends on the use of sites	2	52%	2	50%
I think this Unit depends on the use of resource people	1	25%	3	75%
Goal statements were appropriate for grade/age level	3	75%	1	25%
Activities in the Unit were effective in helping students attain stated goals	4	100%	0	0%
Experience with this Unit has caused me to (or will) modify other courses I teach	3	75%	1	25%
Cost and availability of materials necessary to teach this Unit have been a problem	2	50%	2	50%
Most of my students were enthusiastic about the Unit	3	75%	1	25%
The Unit was easy to relate to the subject area I taught it in	1	25%	3	75%
The Unit is a valid environmental educational activity	3	75%	1	25%

Teacher Subjective Responses

	Number	Percent
The Number and Percent Using Additional Instructional Materials	0	0%

The following are some of the additional materials that were used in the trial testing of this Unit:

None. Wasn't aware there were any available to us.

The following is a listing of some of the changes recommended, by teachers, before this Unit be taught again:

Students need more information as to the types of environmental problems existing, i.e., in a rural community.

None.

More introductory information, i.e., films, filmstrips, resource people.

A number of teachers had tips and hints for others who may be teaching this Unit. They are:

> Control discussion. At this grade level students tend to ignore the rules established concerning discussion.
>
> Use more films, filmstrips, resource people.
>
> Do not use this unit in a limited time situation.

Teachers were asked to make any free comments relative to this Unit, environmental education, in general, or any other related topics. Comments are as follows:

> I did not fell I did justice to these in teaching. They arrived when my planning was so involved they had to be crowded in.

Student Feedback	Number	Percent
Number of students responding	7	100%
Number and percent of students who thought this Unit was worthwhile.	5	71%
Number and percent who would recommend this Unit to friends.	5	71%

DISTRIBUTION OF STUDENT EXPRESSIONS
OF LIKE AND DISLIKE FOR THIS UNIT

	Number	Percent
Yes, I liked it	6	86%
No, I did not like it	1	14%
Don't know	0	0%

Students were asked for some reasons why they liked or disliked this Unit. Some selected comments are listed here:

It gives you a chance to share ideas with other people.

Kind of boring.

NUMBER AND PERCENT OF STUDENTS RECOMMENDING UNIT CHANGES

	Number	Percent
Yes	2	29%
No	3	43%
Don't know	2	28%

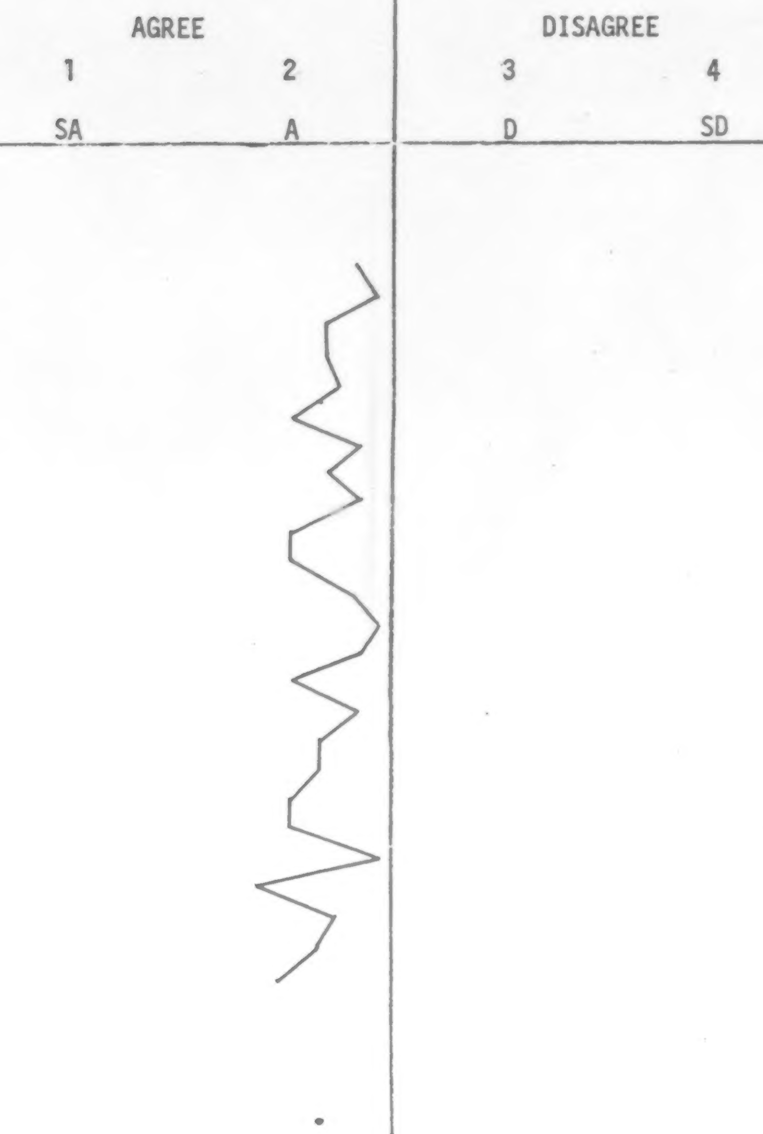
Students were asked for comments relative to Unit changes. Some selected ones are listed here:

Fine the way it is.

APPENDIX F

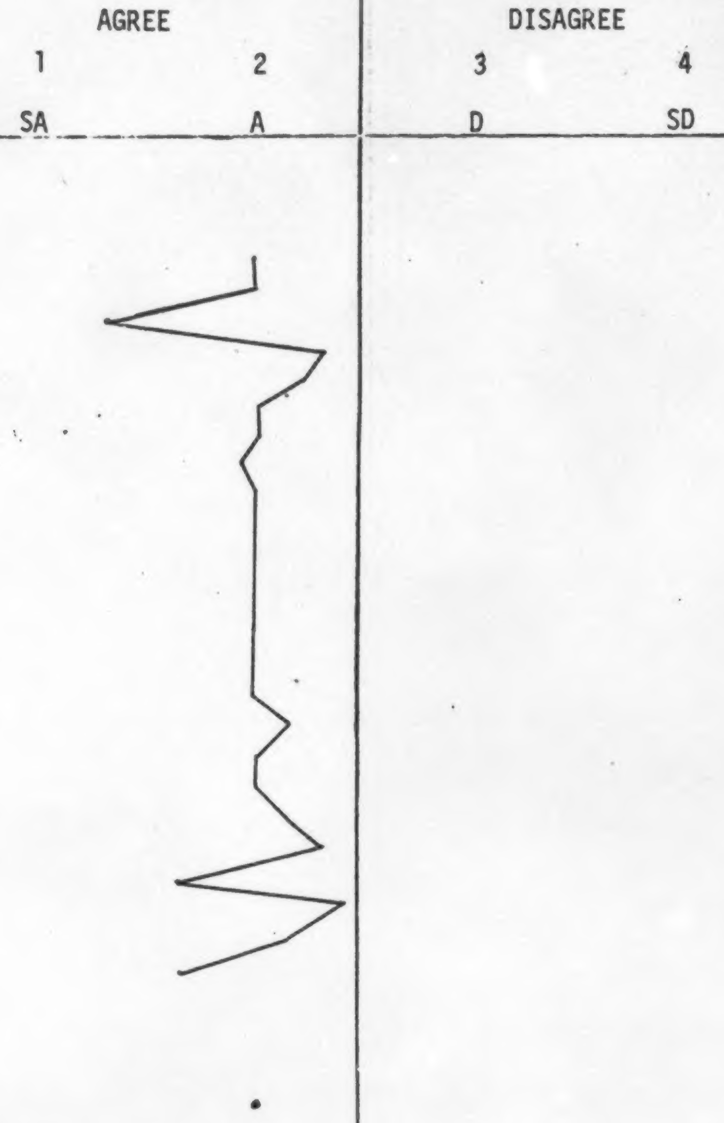
COMPARATIVE PLOTS OF TEACHER OPINIONS RELATIVE TO THE INDIVIDUAL UNIT PARTS

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS OF SCALED ITEM "THE EVALUATION PART WAS USEFUL"



UNIT	Scale Means and N's N	$\overline{X}$
A Classroom Newspaper	9	2.3
Its Your Decision	8	2.4
Environmental Magazines	8	2.1
Growing Environmental Crisis	12	2.1
Pollution: Cause and Effect	13	2.2
Environmental Halo	4	2.0
Pollution and Waste	8	2.3
Energy Crisis	18	2.1
Energy & the Individual	12	2.3
Orienteering	2	2.0
What is it	2	2.0
New Things	3	2.3
Student Interest	5	2.4
Recreational Vehicles	11	2.3
Wilderness	7	2.0
Mystery Walk	11	2.3
How Do You Feel	27	2.1
Phosphorus Leaks	12	2.1
Create A Mammal	27	2.0
Interstate Highway	22	2.0
Interdependency	5	2.4
Our Desire For A Better World	5	1.8
A Different Perspective	9	2.2
Mother of the Year	15	2.1
Cemetary	9	1.9
We Would Like To Do	4	2.5
Mean of all Units Combined	268	2.1

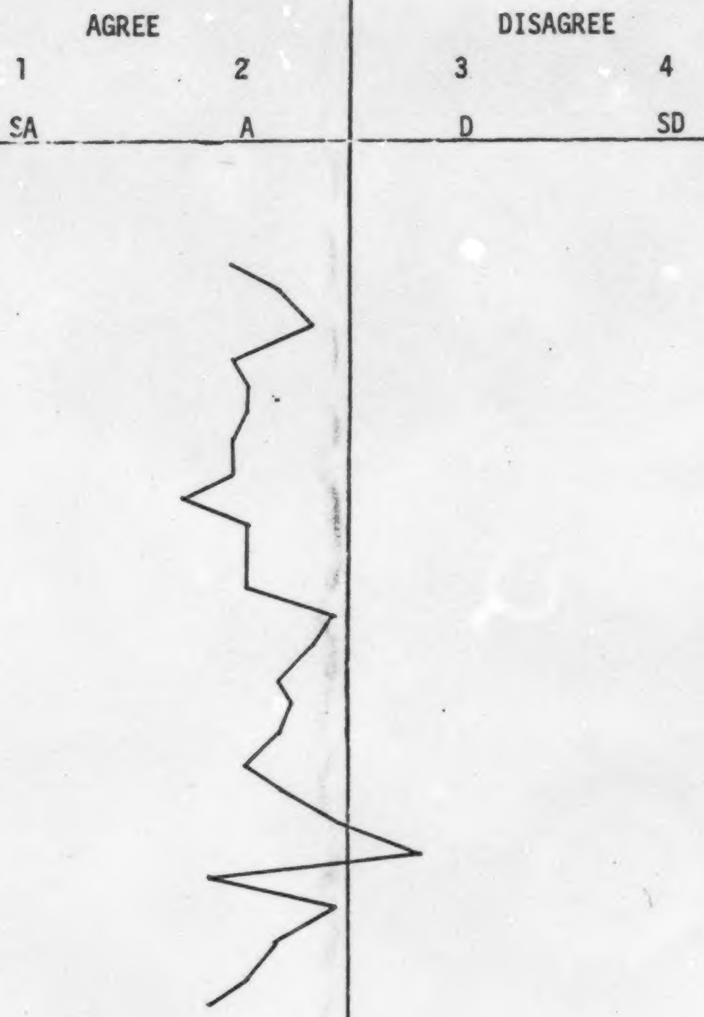
ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS
OF SCALED ITEM "THE DATA SHEET/WORKSHEET WAS USEFUL"



Scale Means and N's

UNIT	N	$\overline{X}$
A Classroom Newspaper	1	2.0
Its Your Decision	6	2.0
Environmental Magazines	3	1.3
Growing Environmental Crisis	7	2.3
Pollution: Cause and Effect	5	2.2
Environmental Halo	4	2.0
Pollution and Waste	7	2.0
Energy Crisis	16	1.9
Energy & the Individual	12	2.0
Orienteering	2	2.0
What is it	2	2.0
New Things	2	2.0
Student Interest	1	2.0
Recreational Vehicles	5	2.0
Wilderness	4	2.0
Mystery Walk	2	2.0
How Do You Feel	15	2.1
Phosphorus Leaks	7	2.0
Create A Mammal	16	2.0
Interstate Highway	14	2.1
Interdependency	4	2.3
Our Desire For A Better World	5	1.6
A Different Perspective	9	2.4
Mother of the Year	9	2.1
Cemetary	8	1.6
We Would Like To Do	-	-
Mean of all Units Combined	166	2.0

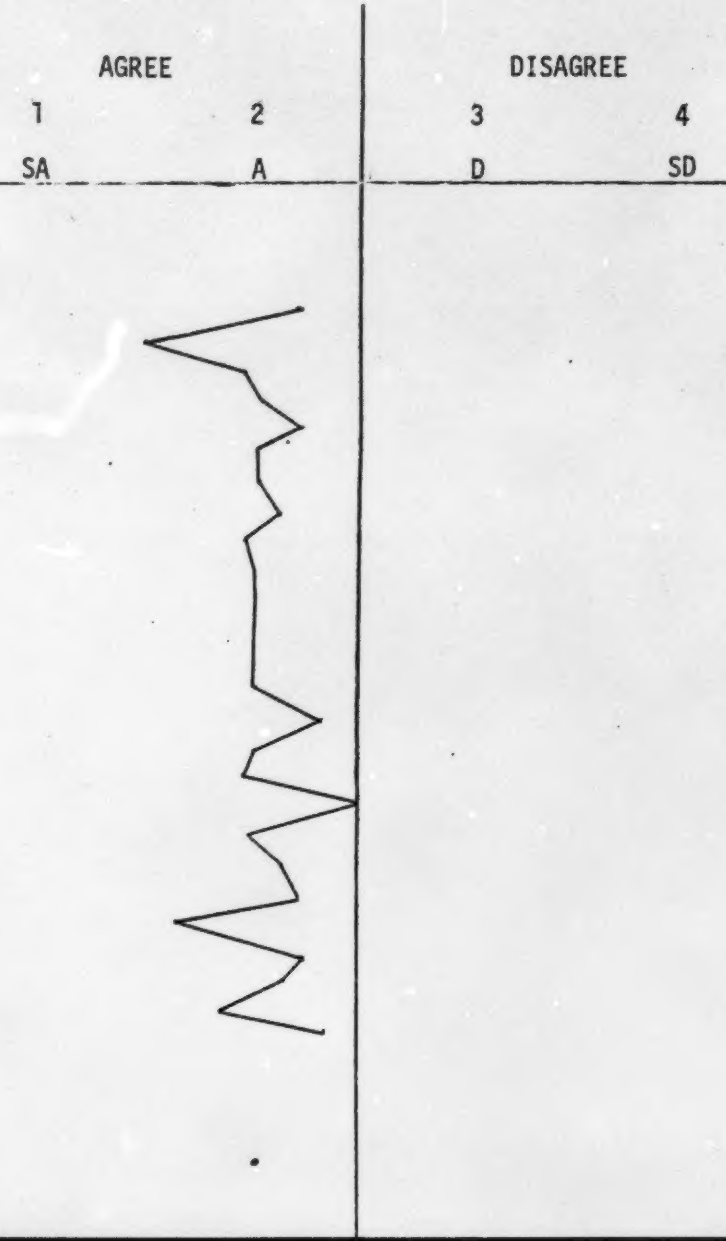
ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS OF SCALED ITEM "THE ACTIVITY DESCRIPTION WAS ADEQUATE"



UNIT	N	$\overline{X}$
A Classroom Newspaper	9	1.9
Its Your Decision	7	2.1
Environmental Magazines	8	2.3
Growing Environmental Crisis	12	1.9
Pollution: Cause and Effect	13	2.0
Environmental Halo	4	2.0
Pollution and Waste	8	1.9
Energy Crisis	18	1.9
Energy & the Individual	13	1.7
Orienteering	3	2.0
What is it	2	2.0
New Things	4	2.0
Student Interest	5	2.4
Recreational Vehicles	12	2.3
Wilderness	7	2.1
Mystery Walk	12	2.2
How Do You Feel	27	2.1
Phosphorus Leaks	12	2.0
Create A Mammal	30	2.1
Interstate Highway	22	2.4
Interdependency	5	2.8
Our Desire For A Better World	5	1.8
A Different Perspective	8	2.4
Mother of the Year	15	2.1
Cemetary	9	2.0
We Would Like To Do	4	1.8
Mean of all Units Combined	274	2.1

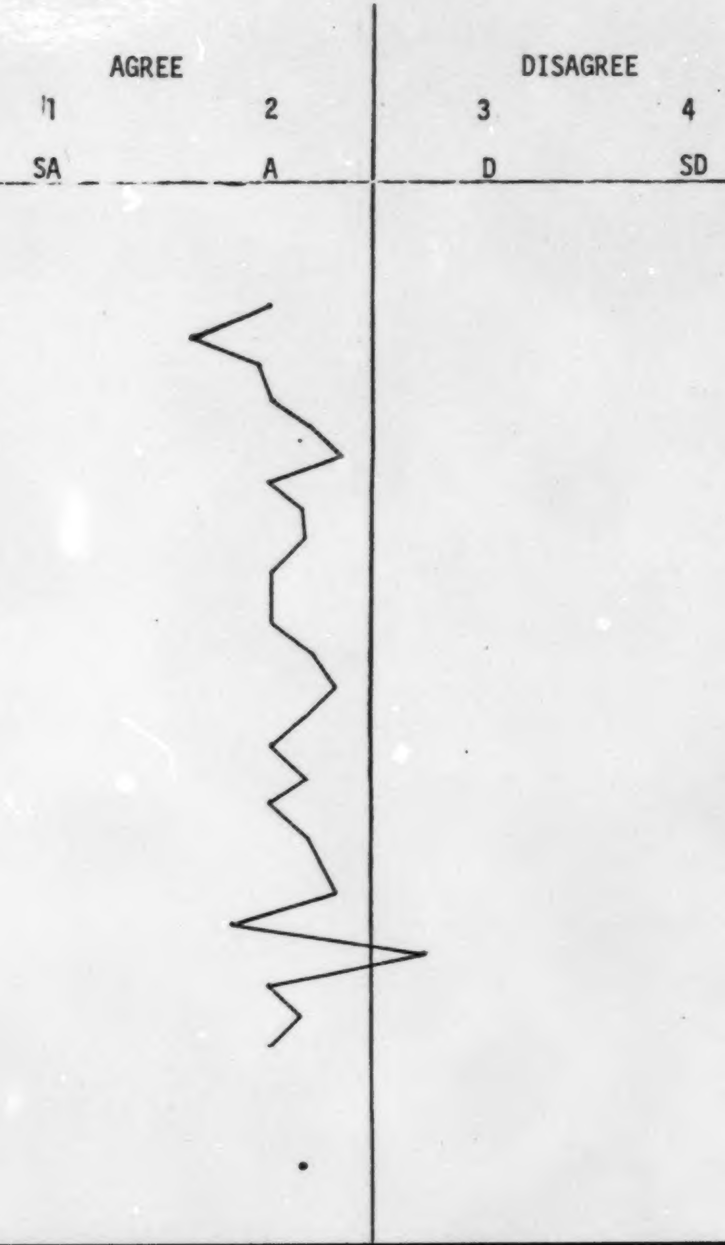
Scale Means and N's

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS
OF SCALED ITEM "THE GOAL STATEMENTS WERE CLEAR"



UNIT	Scale Means and N's	
	N	$\overline{X}$
A Classroom Newspaper	9	2.2
Its Your Decision	8	1.5
Environmental Magazines	8	1.9
Growing Environmental Crisis	12	2.0
Pollution: Cause and Effect	13	2.2
Environmental Halo	4	2.0
Pollution and Waste	8	2.0
Energy Crisis	18	2.1
Energy & the Individual	14	1.9
Orienteering	3	2.0
What is it	2	2.0
New Things	4	2.0
Student Interest	5	2.0
Recreational Vehicles	12	2.0
Wilderness	7	2.3
Mystery Walk	12	2.0
How Do You Feel	27	1.9
Phosphorus Leaks	11	2.5
Create A Mammal	30	1.9
Interstate Highway	21	2.1
Interdependency	6	2.2
Our Desire For A Better World	5	1.6
A Different Perspective	9	2.2
Mother of the Year	16	2.1
Cemetary	9	1.8
We Would Like To Do	4	2.3
Mean of all Units Combined	277	2.0

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS OF SCALED ITEM "THE INTRODUCTION WAS ADEQUATE"



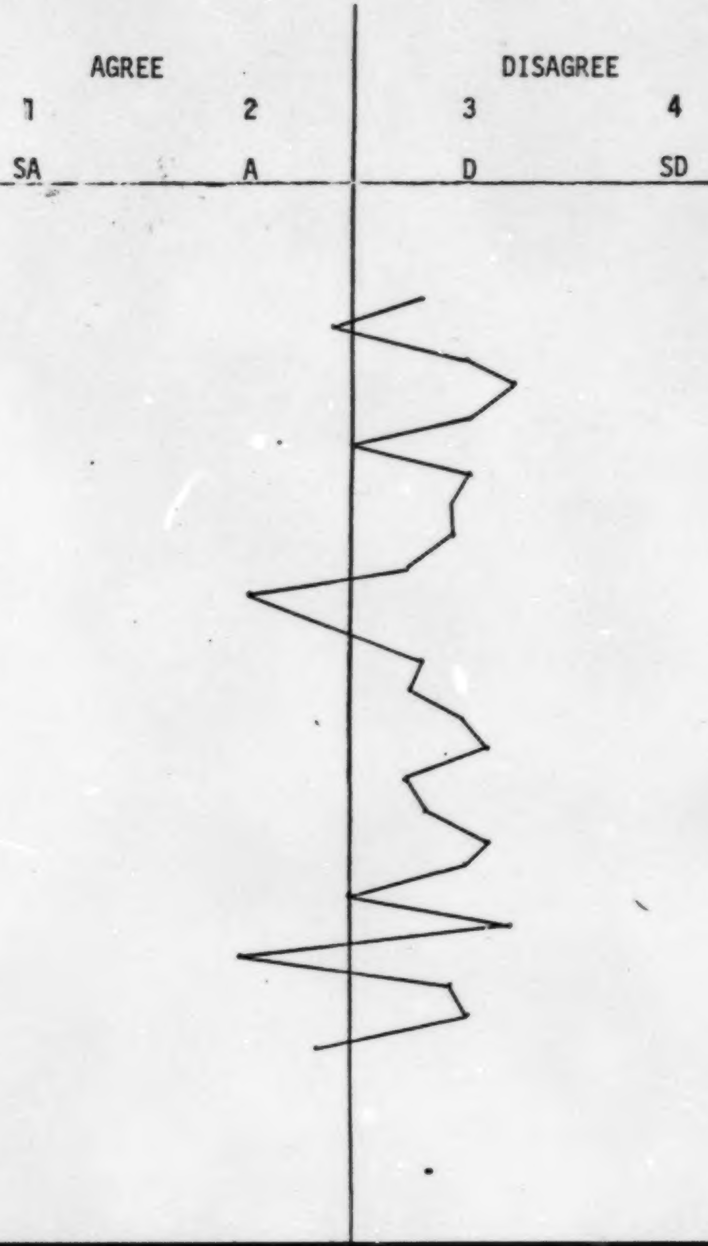
UNIT	N	X̄
A Classroom Newspaper	9	2.0
Its Your Decision	8	1.6
Environmental Magazines	8	1.9
Growing Environmental Crisis	12	2.0
Pollution: Cause and Effect	13	2.1
Environmental Halo	4	2.3
Pollution and Waste	8	2.0
Energy Crisis	18	2.1
Energy & the Individual	14	2.1
Orienteering	3	2.0
What is it	2	2.0
New Things	4	2.0
Student Interest	5	2.2
Recreational Vehicles	12	2.3
Wilderness	7	2.1
Mystery Walk	12	2.0
How Do You Feel	27	2.1
Phosphorus Leaks	11	2.0
Create A Mammal	30	2.1
Interstate Highway	21	2.2
Interdependency	6	2.3
Our Desire For A Better World	5	1.8
A Different Perspective	9	2.7
Mother of the Year	16	2.0
Cemetary	9	2.1
We Would Like To Do	4	2.0
Mean of all Units Combined	277	2[illegible]

APPENDIX G

COMPARATIVE PROFILES OF TEACHER OPINIONS RELATIVE TO INDIVIDUAL IMPLEMENTATION

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS

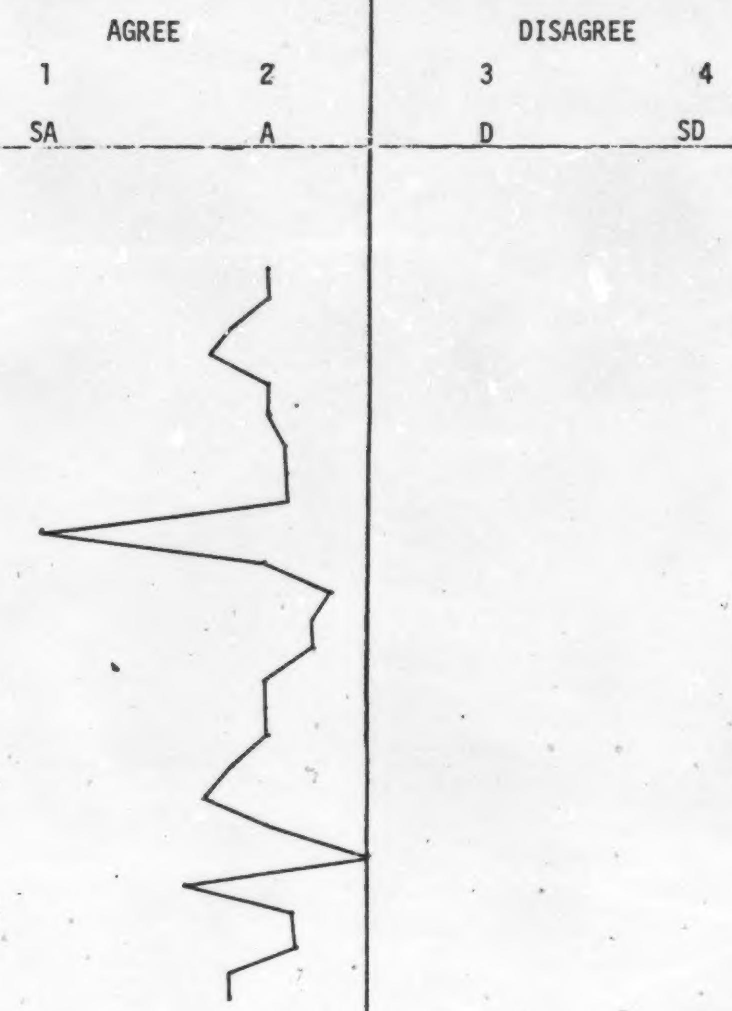
OF SCALED ITEM "I HAD PROBLEMS IMPLEMENTING THIS UNIT"



UNIT	N	$\overline{X}$
A Classroom Newspaper	9	2.8
Its Your Decision	7	2.4
Environmental Magazines	8	3.0
Growing Environmental Crisis	12	3.2
Pollution: Cause and Effect	13	3.0
Environmental Halo	4	2.5
Pollution and Waste	8	3.0
Energy Crisis	17	2.9
Energy & the Individual	14	2.9
Orienteering	3	2.7
What is it	2	2.0
New Things	4	2.5
Student Interest	5	2.8
Recreational Vehicles	12	2.7
Wilderness	7	3.0
Mystery Walk	12	3.1
How Do You Feel	27	2.7
Phosphorus Leaks	12	2.8
Create A Mammal	30	3.1
Interstate Highway	22	3.0
Interdependency	6	2,5
Our Desire For A Better World	5	3.2
A Different Perspective	9	1.9
Mother of the Year	16	2.9
Cemetary	9	3.0
We Would Like To Do	4	2.3
Mean of all Units Combined	277	2.8

Scale Means and N's

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS OF SCALED ITEM "I WOULD TEACH THIS UNIT AGAIN"

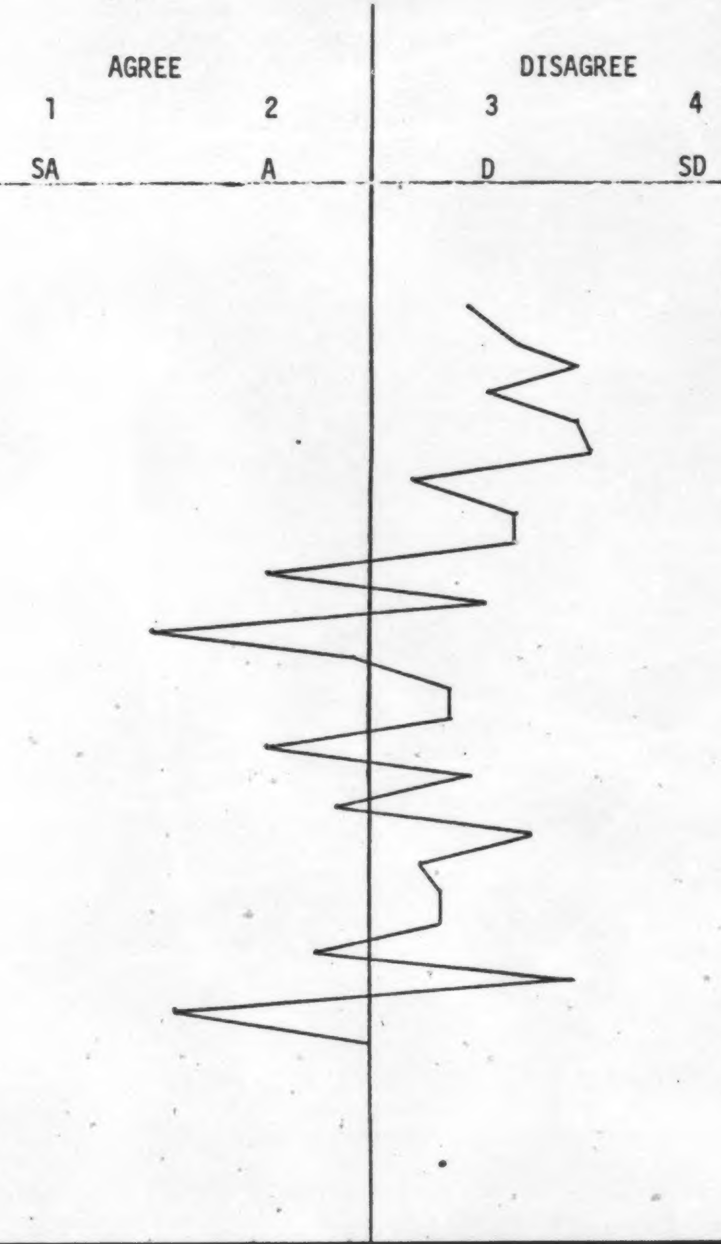


UNIT	N	$\overline{X}$
A Classroom Newspaper	9	2.0
Its Your Decision	7	2.0
Environmental Magazines	8	1.8
Growing Environmental Crisis	12	1.7
Pollution: Cause and Effect	13	2.0
Environmental Halo	4	2.0
Pollution and Waste	7	2.1
Energy Crisis	18	2.1
Energy & the Individual	14	2.1
Orienteering	2	1.0
What is it	2	2.0
New Things	4	2.3
Student Interest	5	2.2
Recreational Vehicles	11	2.2
Wilderness	7	2.0
Mystery Walk	12	2.0
How Do You Feel	27	2.0
Phosphorus Leaks	12	1.8
Create A Mammal	30	1.7
Interstate Highway	22	2.0
Interdependency	6	2.5
Our Desire For A Better World	5	1.6
A Different Perspective	9	2.1
Mother of the Year	16	2.1
Cemetary	9	1.8
We Would Like To Do	4	1.8
Mean of all Units Combined	275	2.0

Scale Means and N's

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS

OF SCALED ITEM "I THINK THIS UNIT DEPENDS ON THE USE OF SITES"

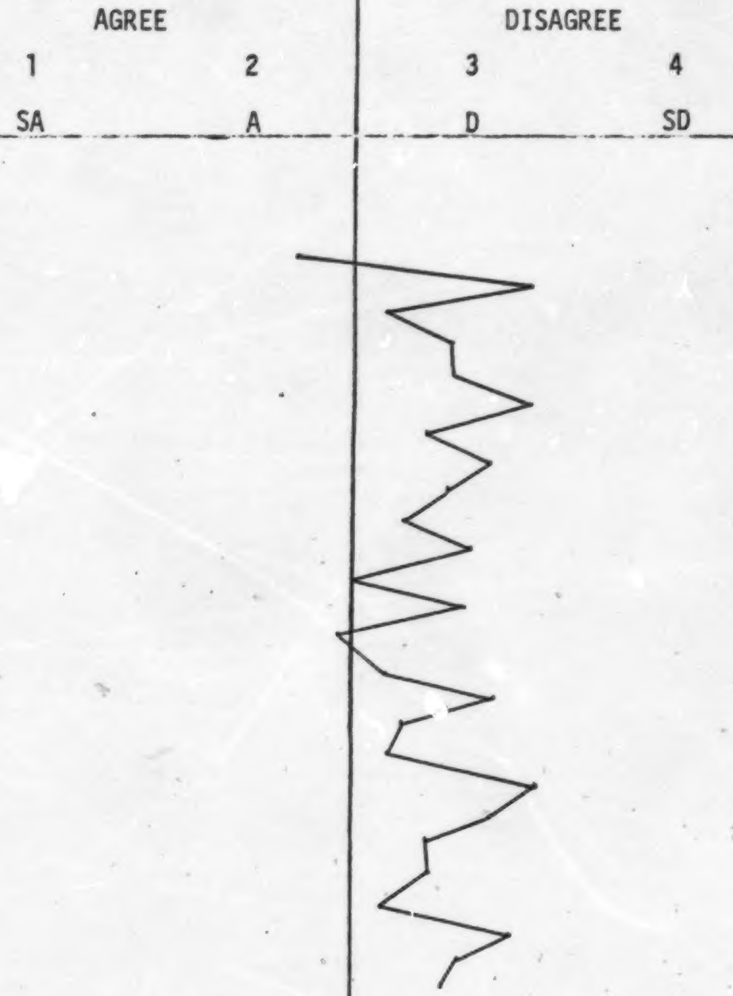


UNIT	N	$\bar{X}$
A Classroom Newspaper	9	2.9
Its Your Decision	7	3.1
Environmental Magazines	8	3.4
Growing Environmental Crisis	12	3.0
Pollution: Cause and Effect	13	3.4
Environmental Halt	4	3.5
Pollution and Waste	8	2.6
Energy Crisis	18	3.1
Energy & the Individual	14	3.1
Orienteering	3	2.0
What is it	2	3.0
New Things	4	1.5
Student Interest	5	2.4
Recreational Vehicles	12	2.8
Wilderness	7	2.8
Mystery Walk	12	2.0
How Do You Feel	27	2.9
Phosphorus Leaks	12	2.3
Create A Mammal	30	3.2
Interstate Highway	22	2.7
Interdependency	6	2.8
Our Desire For A Better World	5	2.8
A Different Perspective	9	2.2
Mother of the Year	16	3.4
Cemetary	9	1.6
We Would Like To Do	4	2.5
Mean of all Units Combined	278	2.8

Scale Means and N's

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS

OF SCALED ITEM "I THINK THIS UNIT DEPENDS ON THE USE OF RESOURCE PEOPLE"

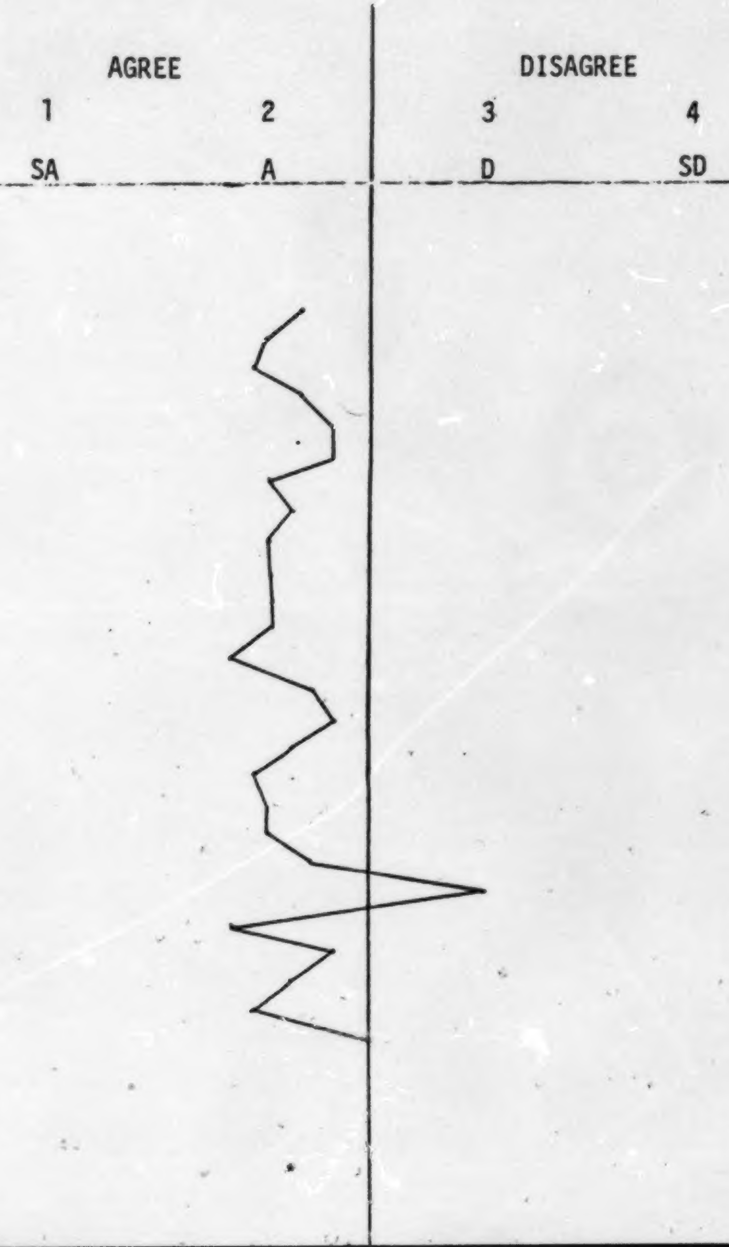


UNIT	N	$\overline{X}$
A Classroom Newspaper	9	2.2
Its Your Decision	7	3.3
Environmental Magazines	8	2.6
Growing Environmental Crisis	12	2.9
Pollution: Cause and Effect	13	2.9
Environmental Halo	4	3.3
Pollution and Waste	8	2.8
Energy Crisis	18	3.1
Energy & the Individual	14	2.9
Orienteering	3	2.7
What is it	2	3.0
New Things	4	2.5
Student Interest	5	3.0
Recreational Vehicles	12	2.4
Wilderness	7	2.6
Mystery Walk	12	3.1
How Do You Feel	27	2.7
Phosphorus Leaks	12	2.6
Create A Mammal	30	3.3
Interstate Highway	22	3.1
Interdependency	6	2.8
Our Desire For A Better World	5	2.8
A Different Perspective	8	2.6
Mother of the Year	16	3.2
Cemetary	9	2.9
We Would Like To Do	4	2.8
Mean of all Units Combined	277	2.9

Scale Means and N's

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS

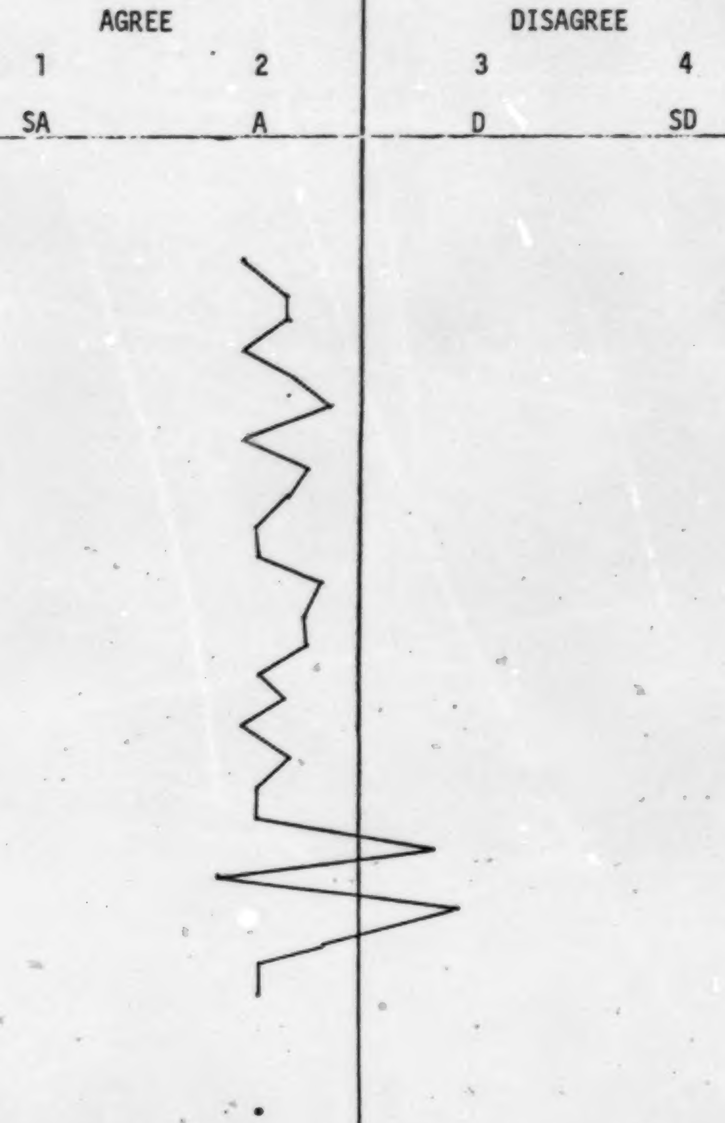
OF SCALED ITEM "GOAL STATEMENTS WERE APPROPRIATE FOR THE GRADE/AGE LEVEL"



UNIT	Scale Means and N's N	$\overline{X}$
A Classroom Newspaper	9	2.1
Its Your Decision	7	2.0
Environmental Magazines	8	1.9
Growing Environmental Crisis	12	2.1
Pollution: Cause and Effect	13	2.3
Environmental Halo	4	2.3
Pollution and Waste	8	2.0
Energy Crisis	18	2.1
Energy & the Individual	13	2.0
Orienteering	2	2.0
What is it	1	2.0
New Things	4	2.0
Student Interest	5	1.8
Recreational Vehicles	12	2.2
Wilderness	7	2.3
Mystery Walk	12	2.1
How Do You Feel	22	1.9
Phosphorus Leaks	12	2.0
Create A Mammal	30	2.0
Interstate Highway	22	2.2
Interdependency	6	3.0
Our Desire For A Better World	5	1.8
A Different Perspective	9	2.3
Mother of the Year	16	2.1
Cemetary	9	1.9
We Would Like To Do	4	2.5
Mean of all Units Combined	275	2.1

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS OF SCALED ITEM

"ACTIVITIES IN THE UNIT WERE EFFECTIVE IN HELPING STUDENTS ATTAIN STATED GOALS"

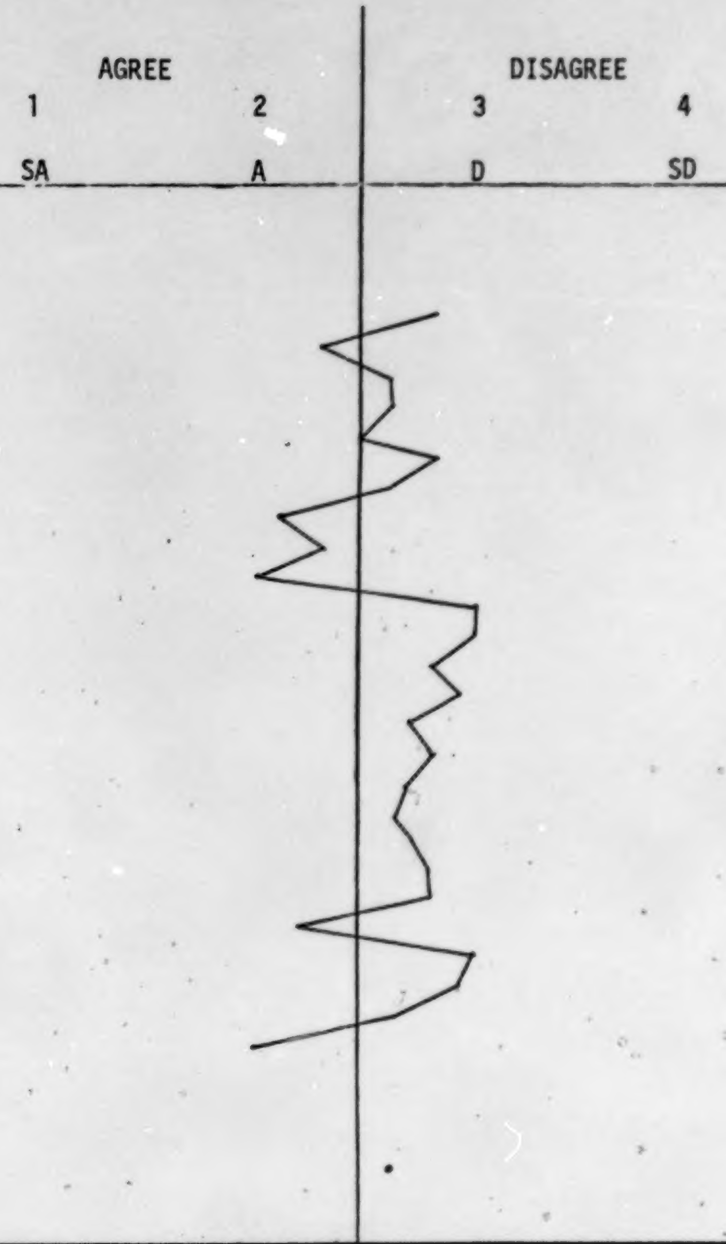


UNIT	N	$\overline{X}$
A Classroom Newspaper	9	1.9
Its Your Decision	7	2.1
Environmental Magazines	8	2.1
Growing Environmental Crisis	12	1.9
Pollution: Cause and Effect	13	2.1
Environmental Halo	4	2.3
Pollution and Waste	8	1.9
Energy Crisis	17	2.2
Energy & the Individual	13	2.1
Orienteering	2	2.0
What is it	2	2.0
New Things	4	2.3
Student Interest	5	2.2
Recreational Vehicles	12	2.2
Wilderness	7	2.0
Mystery Walk	12	2.1
How Do You Feel	27	1.9
Phosphorus Leaks	12	2.1
Create A Mammal	30	2.0
Interstate Highway	22	2.0
Interdependency	5	2.8
Our Desire For A Better World	5	1.8
A Different Perspective	9	2.9
Mother of the Year	16	2.3
Cemetary	9	2.0
We Would Like To Do	4	2.0
Mean of all Units Combined	27	2.0

Scale Means and N's

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS OF SCALED ITEM

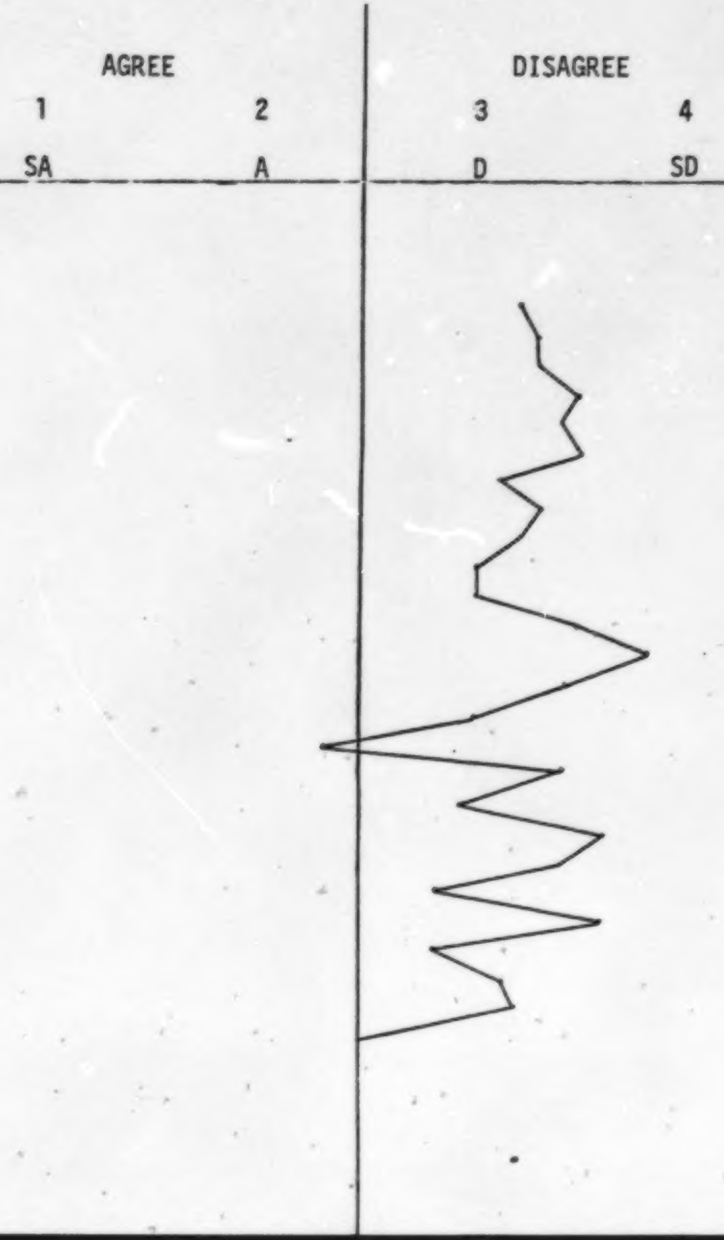
"EXPERIENCE WITH THIS UNIT HAS CAUSED ME TO (OR WILL) MODIFY OTHER COURSES I TEACH"



UNIT	Scale Means and N's N	$\overline{X}$
A Classroom Newspaper	8	2.8
Its Your Decision	7	2.3
Environmental Magazines	8	2.6
Growing Environmental Crisis	12	2.6
Pollution: Cause and Effect	12	2.5
Environmental Halo	4	2.8
Pollution and Waste	8	2.6
Energy Crisis	18	2.1
Energy & the Individual	14	2.3
Orienteering	3	2.0
What is it	2	3.0
New Things	4	3.0
Student Interest	5	2.8
Recreational Vehicles	12	2.9
Wilderness	7	2.7
Mystery Walk	12	2.8
How Do You Feel	27	2.7
Phosphorus Leaks	12	2.6
Create A Mammal	28	2.7
Interstate Highway	22	2.8
Interdependency	5	2.8
Our Desire For A Better World	5	2.2
A Different Perspective	9	3.0
Mother of the Year	14	2.9
Cemetary	7	2.6
We Would Like To Do	4	2.0
Mean of all Units Combined	269	2.6

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS OF SCALED ITEM

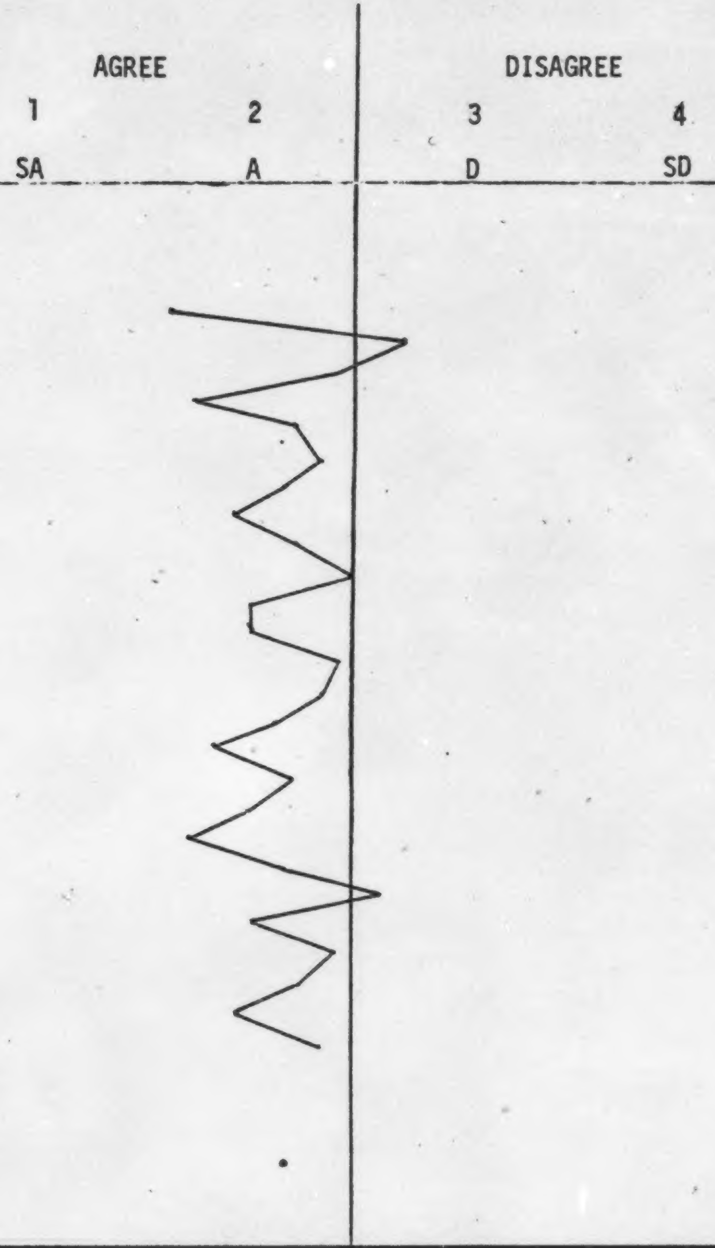
"COST AND AVAILABILITY OF MATERIALS NECESSARY TO TEACH THIS UNIT HAVE BEEN A PROBLEM"



UNIT	Scale Means and N's N	$\overline{X}$
A Classroom Newspaper	9	3.2
Its Your Decision	7	3.3
Environmental Magazines	7	3.3
Growing Environmental Crisis	12	3.5
Pollution: Cause and Effect	13	3.4
Environmental Halo	4	3.5
Pollution and Waste	8	3.1
Energy Crisis	18	3.3
Energy & the Individual	14	3.2
Orienteering	3	3.0
What is it	1	3.0
New Things	4	3.5
Student Interest	5	3.8
Recreational Vehicles	12	3.4
Wilderness	7	3.0
Mystery Walk	12	2.3
How Do You Feel	27	3.4
Phosphorus Leaks	12	2.9
Create A Mammal	29	3.6
Interstate Highway	22	3.4
Interdependency	6	2.8
Our Desire For A Better World	5	3.6
A Different Perspective	9	2.8
Mother of the Year	16	3.1
Cemetary	9	3.2
We Would Like To Do	4	2.5
Mean of all Units Combined	275	3.2

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS

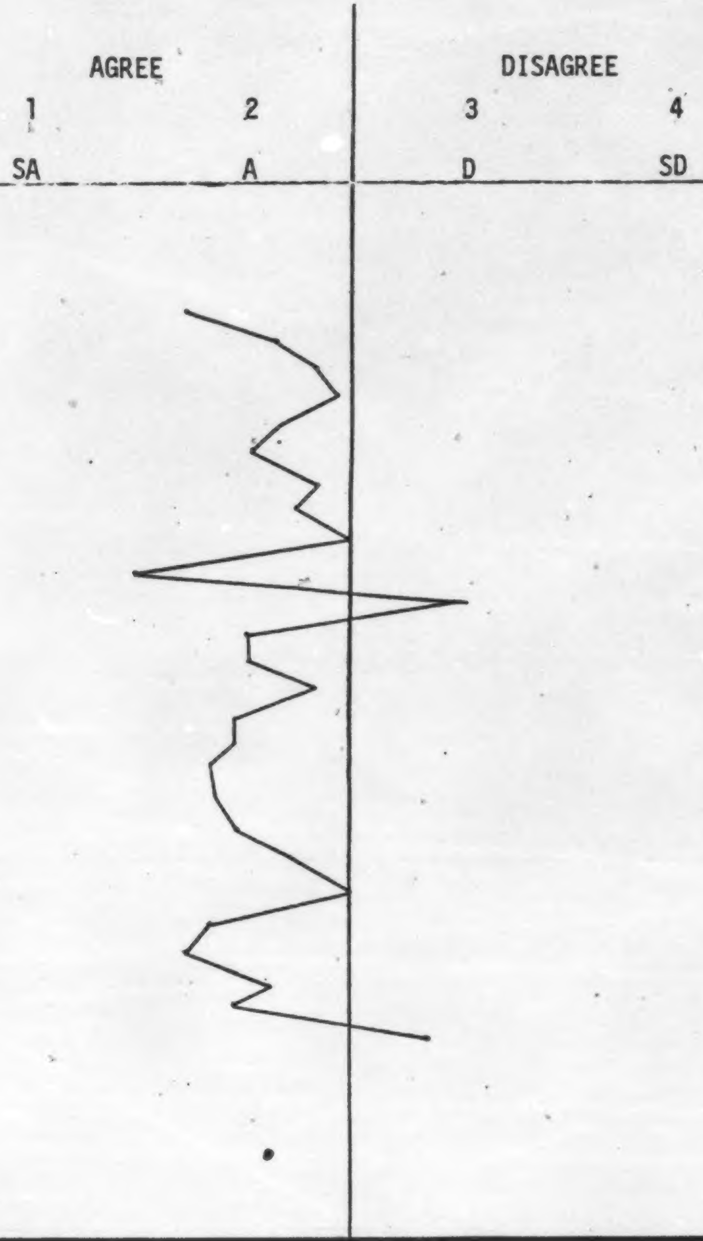
OF SCALED ITEM "MOST OF MY STUDENTS WERE ENTHUSIASTIC ABOUT THE UNIT"



UNIT	N	$\overline{X}$
A Classroom Newspaper	9	1.6
Its Your Decision	6	2.7
Environmental Magazines	7	2.4
Growing Environmental Crisis	12	1.7
Pollution: Cause and Effect	12	2.2
Environmental Halo	4	2.3
Pollution and Waste	8	2.1
Energy Crisis	18	1.9
Energy & the Individual	13	2.2
Orienteering	2	2.5
What is it	1	2.0
New Things	4	2.0
Student Interest	5	2.4
Recreational Vehicles	12	2.3
Wilderness	7	2.1
Mystery Walk	12	1.8
How Do You Feel	27	2.2
Phosphorus Leaks	11	2.0
Create A Mammal	30	1.7
Interstate Highway	22	2.1
Interdependency	5	2.6
Our Desire For A Better World	4	2.0
A Different Perspective	8	2.4
Mother of the Year	16	2.2
Cemetary	9	1.9
We Would Like To Do	4	2.3
Mean of all Units Combined	268	2.1

Scale Means and N's

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS OF SCALED ITEM "THE UNIT WAS EASY TO RELATE TO THE SUBJECT AREA I TAUGHT IT IN"

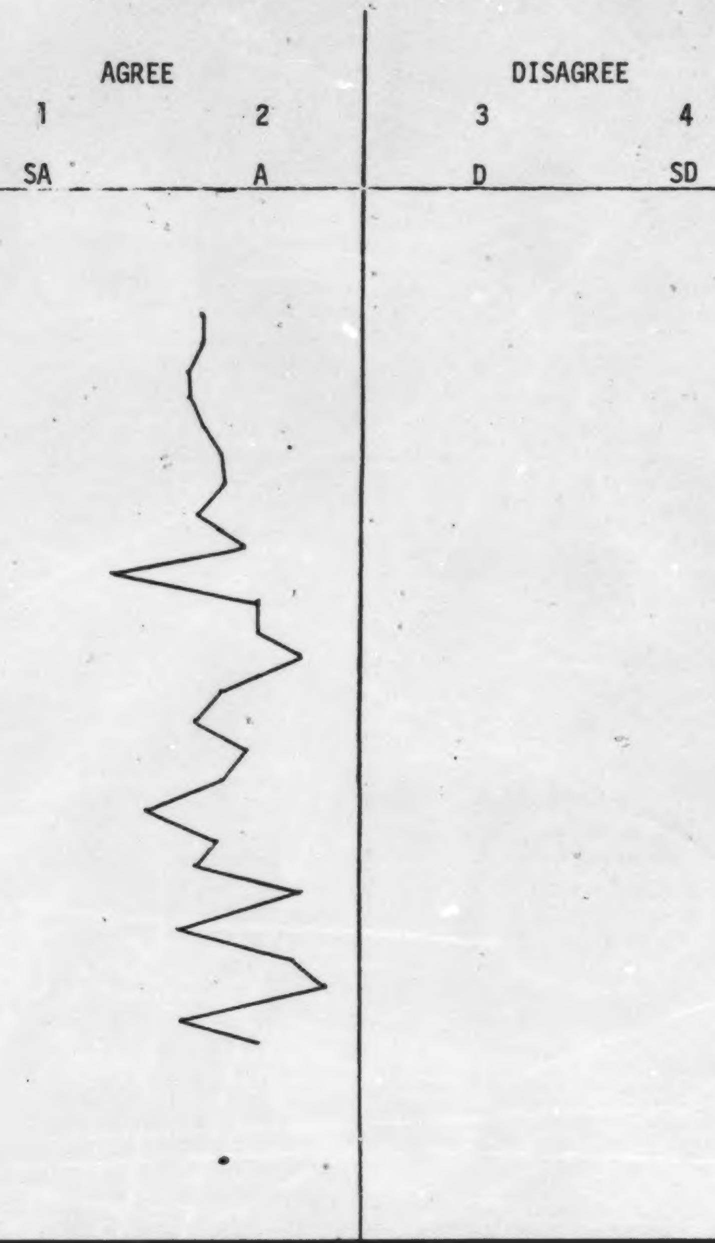


UNIT	N	$\overline{X}$
A Classroom Newspaper	9	1.7
Its Your Decision	7	2.1
Environmental Magazines	8	2.3
Growing Environmental Crisis	12	2.4
Pollution: Cause and Effect	13	2.1
Environmental Halo	4	2.0
Pollution and Waste	8	2.3
Energy Crisis	18	2.2
Energy & the Individual	14	2.5
Orienteering	2	1.5
What is it	2	3.0
New Things	4	2.0
Student Interest	5	2.0
Recreational Vehicles	12	2.3
Wilderness	7	1.9
Mystery Walk	12	1.9
How Do You Feel	26	1.8
Phosphorus Leaks	12	1.8
Create A Mammal	29	1.9
Interstate Highway	22	2.2
Interdependency	6	2.5
Our Desire For A Better World	4	1.8
A Different Perspective	9	1.7
Mother of the Year	16	2.1
Cemetary	9	1.9
We Would Like To Do	4	2.8
Mean of all Units Combined	224	2.1

Scale Means and N's

ENVIRONMENTAL EDUCATION SECONDARY UNITS PROFILE OF MEANS

OF SCALED ITEM "THE UNIT IS A VALID ENVIRONMENTAL EDUCATION ACTIVITY"



UNIT	N	X̄
A Classroom Newspaper	9	1.7
Its Your Decision	7	1.7
Environmental Magazines	8	1.6
Growing Environmental Crisis	12	1.6
Pollution: Cause and Effect	13	1.7
Environmental Halo	4	1.8
Pollution and Waste	8	1.8
Energy Crisis	18	1.7
Energy & the Individual	14	1.9
Orienteering	3	1.3
What is it	2	2.0
New Things	3	2.0
Student Interest	5	2.2
Recreational Vehicles	12	1.8
Wilderness	7	1.7
Mystery Walk	12	1.9
How Do You Feel	26	1.8
Phosphorus Leaks	12	1.5
Create A Mammal	30	1.8
Interstate Highway	22	1.7
Interdependency	6	2.2
Our Desire For A Better World	5	1.6
A Different Perspective	9	2.1
Mother of the Year	16	2.3
Cemetary	8	1.6
We Would Like To Do	4	2.0
Mean of all Units Combined	275	1.8

Scale Means and N's

APPENDIX H

UNITS NOT MEETING ARBITRARY CRITERION OF FIFTY PERCENT OR MORE TEACHERS

UNITS NOT MEETING AN ARBITRARY CRITERION OF FIFTY PERCENT OR MORE TEACHERS

Category	Unit Not Meeting Criterion
Adequacy of the activity description part of the Unit.	Interdependency
Clarity of good statement part of the Unit.	Phosphorus Leaks
Adequacy of introduction part of Unit.	A Different Perspective
Unit implementation was no problem.	It's Your Decision What Is It? A Different Perspective We Would Like To
Would teach the Unit again.	Interdependency
Unit does not depend on use of sites.	Orienteering New things Student Interest Mystery Walk Phosphorus Leaks A Different Perspective Cemetery
Unit does not depend on resource people.	A Classroom Newspaper Recreational Vehicles New Things
Appropriateness of Unit goal statements for grade/age level.	Interdependency
Effectiveness of Unit in helping students attain stated goals.	Interdependency A Different Perspective

Experience with Unit has caused modification in other course I teach.	It's Your Decision Pollution: Cause and Effect Energy Crisis Energy and the Individual Orienteering Our Desire for a Better World We would Like To Do
Cost and material availability no problem.	Mystery Walk We Would Like To Do
Students enthusiastic.	It's Your Decision Orienteering Interdependency
Unit easy to relate to subject area taught in.	Energy and the Individual What Is It? Interdependency We Would Like To Do